

## Ferranti in digital voice debut

by Kevin Cahill  
FERRANTI will shortly launch a major digital voice management system as part of an ambitious strategy to give its Office Systems Division a £200 million turnover by 1987.

The voice management system, which is based on Ferranti's own computer technology, will be demonstrated for the first time at the Telecommunications Fair in Brighton next month.

Details of the product, which is aimed at a market estimated to be worth £330 million in 1987, are scarce, but the product will not need a special PBX as does the IBM voice management system.

It is also expected to cost substantially less than the IBM

products. Some sources are talking about a price about one-third to half that of the IBM machine which has an entry level price of £125,000.

The goal for the Office Systems Division is set by divisional director Frank Fensome, who notes that growth last year, and in the current year, is running at about 33% per annum.

"We aim to double the division's turnover every three years," he says.

This year demand for the company's PT7 IBM and ICL compatible terminal has run so far ahead of expectations that the division has opened a new 40,000 square foot production facility well ahead of plans.

The new facility has created 200 jobs this year in an area where unemployment is close to 30%.

The Office Systems Division is based at Wythenshawe and about 50% of the division's sales come from bespoke work based on the Argus. A project involving more than 50 minicomputers for the Thames Nuclear power station is under way at Wythenshawe, alongside several other major projects for oilfields and conventional power stations.

Over the past two years the Wythenshawe division has developed its basic telecommunications expertise into a successful telex manager system based on the PT80 terminal and Argus computer.



FENSOME... 33% growth.

## Digital goes to consumers

by George Black  
DIGITAL Research, owner of the CPM micro operating system, is aiming to hit the consumer market with the help of a new top-level recruit from Atari.

California-based Digital has set up a consumer products division to write, buy, and distribute cheap applications for home and school. It believes the bottom has fallen out of the games market and in its place a market is springing up for domestic and housekeeping programs with a price ceiling of £30.

Digital's new consumer division manager Kenneth Harkness has a long track record in consumer products, having previously worked for General Foods and Pepsi, which also gave Apple its new chief.

Digital's president John Rowley said it would become a leading supplier of home and education software and has been gearing itself up for this role for some time.

The project will include signing up some mass merchandisers - presumably high street shops - as well as OBM and independent software developers and vendors.

## BT network is slow to open up

■ From front page

Devices which can be attached to the public telephone network must be marked clearly with a red BAPT approval sticker.

BAPT associate director Barry Cartman said that if equipment went straight through the approval process, it was quite quick. But if repeated modifications were needed it could take months.

There is another difficulty for the BCD terminal. P&F Marketing and BCD both intend to market the device, and to avoid the worst effects of direct competition they have agreed not to compete on price. But a spokeswoman for the Office of Fair Trading, having learned of the arrangement from *Computer Weekly*, said: "The Resale Price Act 1976 makes it broadly unlawful for suppliers of goods to require their dealers and distributors not to sell goods for less than an indicated resale price."

Charles Shandland, managing director of BCD Terminal, said: "No agreement has been signed yet. Our lawyers are working on it. We are not planning to compete, but we are planning to be lawful. We will have to look into the approval situation."

A spokesman for Barclays said: "We have not felt any effects of the POEU action." BP and Cable and Wireless also said that the action had not had any effect so far.

BT declined to discuss whether the POEU's action was having any



SMITH... In the UK looking for distributors.

## Software safety for 35 pence

by Kevin Cahill  
SOFTWARE protection for even the smallest software supplier, at about 35p per diskette, will be available in the UK from next month.

The product is the Prolok software copy protection system from the Vault Corp. It is currently being launched in the US and the UK by one of the company's founders, Dixon Smith.

According to Smith, the product was created by a Danish expatriate software supplier in the US, J. Krag Broby, originally to protect his own products, but with an eye on selling the protection system if it proved successful.

"It took 18 months and a lot of mistakes to get the final product right," Smith said.

Smith is in the UK to find distributors for the product. He hopes to conduct detailed negotiations in

Europe as well as the UK prior to his return to the US.

So far he estimates that the overall micro software market in the US is worth about \$1 billion.

"A recent survey suggests that about 40% of this market is lost because of casual copying," Smith said.

Most of the copying is done not by large scale pirates, but by individuals making casual copies for their friends.

According to Broby, every software diskette sold is copied eight times by the casual copier and the business professional.

A recent US survey discovered that teachers were among the main culprits in illicit copying.

Brian Reynolds, chairman of UK software house Micro Focus, said: "In the long term, something has to be sorted out to ensure the viability of the software industry."

## Hardware smuggler faces jail

by George Black  
TWO Austrians look as if they will escape prosecution on charges of illegally exporting high technology to the Eastern bloc, after unsuccessful attempts by the US government to have them extradited.

America is reported to be angry with the Austrian government for failing to respond either to its extradition requests or to bring the two to trial in their own country.

Meanwhile a West German involved in the same incident has been put on trial in the US and could be sent to prison for 50 years and fined up to \$50,000.

Gunter Nachtrab, 42, was

found guilty on 10 charges under the Export Administration Act, each charge carrying a maximum penalty of five years in jail. The US government lawyer, Thomas Buchanan, said he would be asking the court at Alexandria, Virginia, for a prison sentence, when it meets again in September.

Nachtrab is at present out on bail, but has had his passport impounded, following a similar case in which a British businessman Moller Butcher eluded bail.

The Reagan administration has been seeking to clamp down on what it sees as a worrying outflow of defence-related expertise to Russia and Eastern Europe. In

April Nachtrab, another West German, Klaus Teller, and the two Austrians were indicted after a year-long investigation by Commerce Department officers.

Buchanan said the Americans knew there was no agreement with either Austria or West Germany on extraditions in such cases but asked for an exception to be made in view of the gravity of the offences.

In West Germany Teller has been questioned and may be prosecuted.

Nachtrab was found guilty of shipping products of National Semiconductor, Hewlett-Packard, Motorola and Advanced

Micro Devices. The US Commerce Department had allowed the products to be exported in the belief that it would be used by the West German post office.

Recipients were said to be Anna Landau and her daughter Jeanette Wellens in Vienna, who are alleged to have passed the goods on to Hungary. They will be arrested if they visit the US.

Meanwhile in Switzerland seven people have been fined a similar but unrelated case of illegal exports to the Eastern bloc. They included employees of Favag, a subsidiary of the Swiss telecommunications company Hseler in Neuchâtel.

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## Prices down as micro slump grows

by John Kavanagh  
THE shake-out of the microcomputer industry last week spread from the home computer market to business systems. Two UK firms were among the first casualties.

Market leader Commodore led the way with massive 25% price cuts. It was followed by Osborne and Hewlett-Packard. Commodore warned that firms involved in product assembly rather than full-scale manufacture would be at great risk.

Hewlett-Packard said there would be a shake-out of four or five manufacturers in a few years' time. These developments came as the UK portable computer manufacturers - Newbrain supplier

Grundig Business Systems and Information and Technology Computer Services - were on the brink of liquidation (see back page). Meanwhile, Sirius manufacturer Victor announced 600 redundancies in the US.

"It's absolutely clear that there has to be a shake-out," said Mike Tait, Commodore's UK business systems sales manager. "Assembly firms in particular can't possibly

compete with the advanced manufacturing facilities of companies like IBM, DEC and Commodore."

"When a firm starts growing it finds it very difficult to remove inefficiency in very efficient manufacturing."

"In addition, many suppliers grab any new technology that comes along; they supersede their current products too often, so they never get the chance to take advantage of established production runs."

Tait did not believe there would be a price war, but Hewlett-Packard said the war was already on. "IBM has been squeezing people out by cutting personal computer prices in the US," said Ken Pack, a personal computers section manager at Hewlett-Packard.

ard. "The also-rans are being pushed off the shelf in terms of pricing and availability."

IBM said there were no plans for price cuts in the UK. Hewlett-Packard has reduced its prices by introducing B models of its HP85 and 86 personal computers. The HP85B offers more facilities than the 85A at around the same price, and the HP85B is nearly £890 cheaper than the less powerful 86A.

Troubled Osborne has cut its price by \$700 in the US. This is reflected in the UK by the offer of up to £800 of "free" software with each computer.

"Tandy said it was not affected by what others were doing. They have our own shops, so we're not fighting for shelf space as the others are," said UK marketing manager Vince Moore. "We're insulated from the price war."

Meanwhile the price war and problems of the home computer market continue. Texas Instruments has cut the price of its 99-4A to £99.95 to provide the first 16-bit machine at under £100. At the same time the company has laid off 450 temporary workers in its consumer products group in the US. Commodore has been hit by disc drive shortages for its 64 home computer.



Tait to be shake-out.

## Staff rebuff union on pay

by George Black  
Over 10,000 staff have given their union leaders a rebuff by voting against their recommendation to reject the latest management pay offer.

Union officials, who were warning of a strike plan, are to meet today to check the ballot figures - but have already conceded "a very small majority" in favour of settling.

About 2,000 customer engineers who are negotiating separately have not reached agreement

with management, though they have been made an identical offer. The result of their negotiations was expected early this week. It is felt unlikely they would want to pursue a dispute independently.

An ICL spokesman said they had been told last Thursday by representatives of the four unions involved in the main dispute that the ballot indicated an end to the action. He expected overtime bans involving up to 1,000 workers to be lifted at once as the new pay levels would be implemented as

soon as possible.

After a one-day strike on July 28 ICL increased its offer to 4% on basic rates plus 3% merit bonus. The unions objected to the proportion of merit pay involved, fearing that few would actually receive it. Management's first offer of 3 1/2% on basic and 3 1/2% on merit pay was decisively turned down by a 5:1 majority of the staff.

The unions say the merit payment is not an accurate reflection of employees' value to the company.



GROVES... "UK retailers are very excited."

## Million sales in 1985 is target for new A4-size computer

by John Kavanagh  
US MANUFACTURER Convergent Technologies believes it has created a completely new computer industry market with the launch of a portable business computer the size of an A4 pad - which also acts as a telephone and answering machine.

UK retailers are "very excited" by the new product, said international sales director Bob Groves. The eight-bit Workalot, formerly codenamed Ultra, costs \$895 - and the company expects to sell 300,000 by the end of next year and well over a million in 1985.

"Workalot runs one application: a spreadsheet," said founder and president Allen Michela. "It can do any job which can be organised in rows and columns but not things like word processing. The businessman doesn't type his own letters but dictates them - and he can do that on this machine."

Michela said there was no competition for the product. "We have a marketing job to do to create a niche for Workalot," he said. "Everyone with a personal computer will want one for their briefcase. But it will also have a market among people who do not have any personal computing."

The Workalot consists of a key-

board, a screen with 16 40-character lines, a 40- and 80-character colour printer four inches wide, a cassette drive and 16K of memory for user data, all in the A4-sized package. The screen can be split in two. There is also a built-in microphone, loudspeaker and modem, plus two ports for connecting external devices such as a bigger printer.

Spreadsheet programs for different industries and applications are available on one-inch tape cassettes costing between \$8 and \$35. ■ Continued on page 22

## 450% take-off in sales at Rodime

UK WINCHESTER disc manufacturer Rodime has taken off this year, with sales up 450% to £6.1 million in the first nine months. Profit before tax was up more than six times at £1.5 million.

Rodime said the growth was caused by new confidence in the company in this, its second full year, following a big order from ICI, and the opening of a US office.

Some 60% of its production goes to the US. US confidence was reflected in the fact that Rodime shares had gone from \$8 to \$25 in the last 18 months.

## No redundancies

NEW technology agreements, guaranteeing no compulsory redundancies with the introduction of new technology, have been drawn up by the Department of Health and Social Security and by the National Gridbank. The DHSS agreement is for two years.

## Satellite option

NCR has gone into the voice and data communications services business in the US by forming a subsidiary, NCR Telecommunications Services. The company, which is initially selling space capacity on NCR's own internal links, has already bought an option on a satellite which will be launched in 1985.

## Users combine

SIX users of systems built around Motorola's 68000 microprocessor have banded together to form the 68000 System User Group, backed by money from equipment distributor Hawke Electronics. The group will be chaired by James Matheson of Cambridge University Engineering Department, and includes Perkin Elmer and British Telecom.

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# Local area net costs 'cut by half'

by Philip Hunter

THE cost of local area networking has been dramatically reduced with new software and hardware just announced in the UK by distributor Data Translation. But the products developed in the US by Interlan still do not answer the problem of poor efficiency caused by the lack of low-priced broadband connections on networks.

The products, known collectively as Net/Plus, do answer the criticism that LANs are inflexible, by allowing a wide range of micro and other peripheral devices such as printers to be hooked to the network.

The products include the NTS10 terminal server, which allows eight peripherals or micro with the RS232 connection to plug

into the standard IEEE Ethernet network for £2,673, which works out at less than £350 per device, or less than half the price of previous offerings.

Interlan president Paul Severino says that the network terminal server addresses several key issues for LAN users, including dealing with large numbers of users contending for access to a limited number of ports, switching users between different mainframes, and personal computer networking.

Like other LANs, it simplifies wiring by using a single coaxial cable to connect all devices on the network. "This is likely to be the most compelling reason for users to want local area networks," says Severino.

But there are still critics who



SEVERINO... "Most compelling reason for users to want LANs."

think the time for LANs has not yet come, even with the price performance advantages offered by Net/Plus.

Chris Harbutt, director of Leeds-based Infotec, which develops star-based networks of micros linked via a mini to a main-

frame, says that efficiency is still unacceptable with LANs.

"Some people are happy with Appletalk, even though efficiency is just a joke," he says.

"Until the cost of broadband comes down, LANs are not really feasible."

Howard Karten covers the annual meeting of the American Association for Artificial Intelligence

## There's something artificial about this intelligence

ONE of the tribulations forever waiting to ambush computer reporters is covering an event where the language, and general subject matter, are clear as mud.

Although vendors have occasionally been known to engage in a modest bit of hyperbole or absurd obfuscation, academics and researchers are expected to present their ideas with clarity.

So when your correspondent volunteered to brave the semivoluptuous beat of Washington in August to report on the third annual meeting of the American Association for Artificial Intelligence, he was supremely confident of coming back with a sparkling story that would be a model of elucidation.

Seemingly arcane titles, such as "scheme selection and stochastic inference in modular environments", did not scare off one who in years past has braved far worse-sounding sessions.

That turned out to be vast overconfidence.

The AAAI 83 meeting turned out to be heavily laden with papers written in prose which makes that of barristers and legislative bodies seem clear. One repeatedly heard phrases and words beloved of artificial intelligencers such as "instantiated", "disambiguate", and so on, as well as more down to earth words such as "chinking".

There were some light moments too, though perhaps unintentional. One example of intentional levity was a paper to do with "planning and goal interaction".

This turned out to be a treatise on Chinese recipe preparation via a program called Wok. Discussing

the results of that program Yale University graduate student Kim Hammond explained how he created a recipe and cooked the resulting meal for presentation to his faculty adviser.

The results, he reported, were not especially powerful.

One was saddened by such magnitude of effort yielding such meagre results. It seems easier, and certainly more fun - to stroll over to one's neighbourhood Chinese restaurant for an orgy of eating.

The conference programme listing the location of various talks at the annual meeting of the American Association for Artificial Intelligence was particularly difficult to decipher, leaving one who attended to remark on this apparent example of artificial unintelligence.

Many papers dealt with computer understanding of allegedly very simple situations, such as baseball games, shopping at the supermarket, and so on.

One researcher reported on a program which was able to devise a worthy story about a chap walking down the aisle and buying a can of tuna fish. The program declared that the hero of the story was in a supermarket and reduced the number of words by half in its summary.

Somehow, it seems doubtful that computers will ever fully replace editors.



SMITH... "Most database suppliers are way behind."

## Systems house's database challenge to market leader

by Claire Gooding

SYSTEMS house Computer Associates has tipped other suppliers at the year with its own portable relational database. The CA-Univers database takes Computer Associates out of its customary IBM games software slot and into new territory, as the product comes complete with applications and wide range of micro, mini and mainframes.

Due for a September launch, CA-Univers not only beats better-known database suppliers to providing a true relational database, but is unusually portable. It can work simultaneously under the IBM systems VM, DOS, and OS, and has already been implemented on 68000 microprocessors.

Computer Associates formerly specialised in productivity software but has been gearing up to enter the mass market for some time.

Work on CA-Univers started in the late '70s and Computer Associates managing director Cliff Smith maintains that, as a late entrant in the database field, his company has been able to leapfrog suppliers who are tied to dated hierarchical DBMS systems.

"Fourth generation languages only turn out applications faster; they don't overcome the fundamental problem of bringing user and data together as a relational database does."

Smith also claims that most database suppliers are way behind, citing Oracle, Ingres and Mistral as the only other true relational implementations now available.

Callinet can't show IDMS/R yet, whereas we've already sold 24

copies of CA Universe." Warnico Oil and the City of Louisville are among the users, which are running the database under a variety of operating systems dominated by IBM's DOS.

CA-Univers's portability comes of being written in the Unix language C, and great care has been taken to stick to the principles of relational database management laid down by E. Codd, the originator of the technique.

CA's announcement of the database is part of a much larger plan to change its IBM-compatible image to supply applications and systems software embracing a whole spectrum of hardware. Computer Associates recently took over the microsoftware house Information Unlimited Software, and is now offering its Basifamily of products as part of the micro-to-mainframe service opened up by its portable database.

It will be selling its products on the back of IBM's in-house retailing scheme, by which data processing managers will be able to supply a range of approved software to their in-house users seeking applications.

Cullinet, which at present dominates the database market, remains unimpressed by the threat from Computer Associates. "They are not known as a database supplier," said UK managing director Vic Morris.

"Selling database is not just a matter of feature and function, it's a matter of service and experience. People have tried to move in on us before, because it looks like a lucrative market, but it doesn't worry us."

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# Zilog takes the Newcastle route

by Robert Parry

ZILOG has turned to the Newcastle Connection and Ethernet as the base for a new high standard network product as it officially axes its home-grown local area network, Z-Net.

The new offering is promised for the end of the year.

But dropping Z-Net as a product seems unlikely to have much effect on Zilog.

"We have not really been marketing Z-Net for 18 months in the UK," says Zilog's Northern European general systems manager David Bethel.

Z-Net was launched in mid-1980, then given a hefty push by Zilog at a standard-setting network in April 1981, when the company released full specifications. It was always intended to sit under Ethernet, and used Ethernet principles.

Zilog's hope was that it would be adopted as a standard for the lower end of the networking mar-

ket that could make do with the 800 Kbit per second speed.

Zilog has outgrown the product, and has turned to higher performance protocols for the networking needed for its Series 8000 system. Ethernet remains in favour, though Zilog indicates it will also be looking at network standards to come from IBM and AT&T.

But at the heart of Zilog's new branded offering will be the Newcastle Connection - a software subsystem developed in the computing lab at Newcastle University and sold through MARI, the Microelectronics Applications Research Institute in Newcastle.

"We have been talking to Zilog here and in the US for a long time," confirms MARI managing director Bob Cooper. "They are certainly very interested." Newcastle Connection effectively isolates users of Unix systems from any concern about the physical make-up of the network.

"All they need to know are the

standard Unix commands," adds Cooper.

Zilog is pushing hard on Unix and networking aspects of its Series 8000 machines. Newcastle Connection easily combines both for users.

"I estimate that by the end of the year you will see Zilog's final move on network products," says Bethel. "Z-Net gave us experience and knowledge of LANs. Zilog is committed to local area networking and will keep to an emerging standard. To us that looks like a combination of Ethernet and Newcastle Connection."

Zilog is not alone in outgrowing Z-Net. Among the companies taking advantage of the freely available specification last year was Oxford micro maker Research Machines. It is still using Z-Net technology, but according to marketing director Mike O'Reagan has moved some way from Zilog's original and has done no work with Zilog for the last 18 months.

## Eastern bloc linked with high tech espionage

A CIVIL servant in Belgium's Ministry of Foreign Affairs has been arrested in connection with an alleged electronics espionage network.

Belgian officials in Brussels confirmed that Eugene Michiels was the man concerned but would not comment on reports that he had admitted selling documents to Romanian officials.

The case was reported in the *International Herald Tribune* from Reuters' agency reports. Belgian Foreign Minister Leo Tindemans is said to have announced on the radio that certain diplomats had been expelled from the country.

A government spokesman in Brussels referred to another expulsion from the country in May - that of a Russian named Mikhailov.

The apparent unearthing of a Soviet high technology smuggling network with links to the heart of the Common Market lends further credence to the US government's campaign to clamp down on the traffic in computer parts that could aid the East bloc's military effort.

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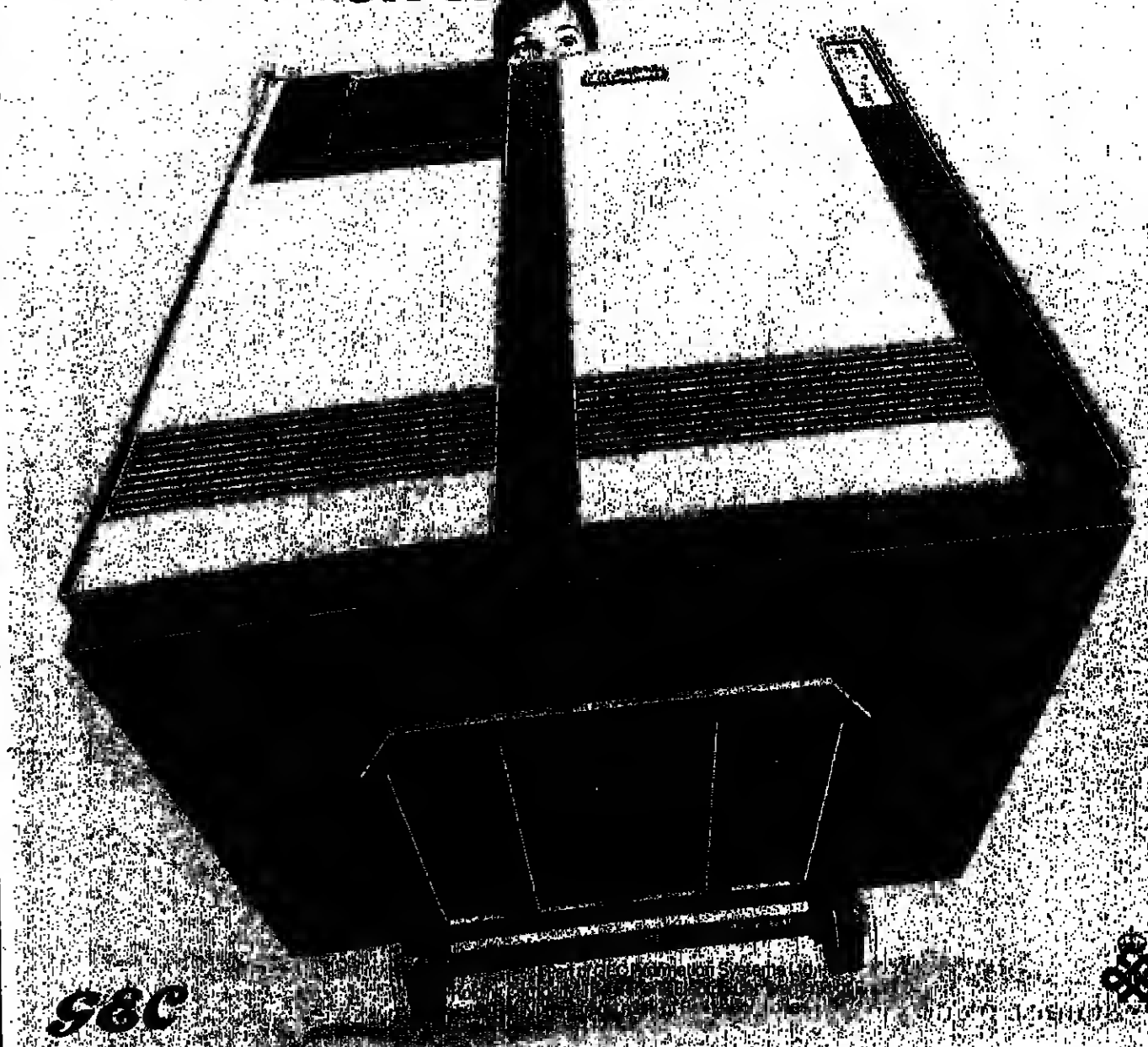
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## 'Corner shops push the wrong machines'

by George Black

UNSCRUPULOUS computer dealers have been pushing unsuitable machines on to small businesses without offering any useful software or support.

This is the message from two professional software companies this week, which are promising to provide for the real needs of vertical markets.

Richard Harris of Intelligence (UK), which launched a package tailor-made for insurance brokers, said 40 systems were already in use by such firms, but they had all failed to cater for the special applications required. In the rush to come to market, sellers had neglected to ask users what they wanted, he said.

The theme was the same from the Computer Management Group (CMG), which is aiming at the

motor dealer sector. Managing director Mike Dunn said smaller dealers had been persuaded to buy underpowered machines from the corner shop and later found they were inadequate.

Intelligence and CMG are approaching the rapidly-expanding vertical markets field from opposite directions and for different reasons. Intelligence is moving out of its home base of the widely-used Micromodeler where it may feel threatened by rival Perfox. It is, therefore, a logical expansion into related financial areas.

CMG acquired fame as a bureau. In particular it built up a strong client base among motor dealers. Now these customers want to run their own show.

CMG is offering them rental systems on a TeleVideo micro or to buy on a Philips P4000 mini for up to £40,000.



DUNN... "Some corner shops persuade small dealers to buy inadequate machines."

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## Big firms limit number of vendors

by Caroline Burgess  
PURCHASE of office automation equipment in large organisations is increasingly being limited to a few preferred vendors, as companies switch from dedicated word processors to personal computers.

Companies are becoming more aware of the need for a consistent development towards full office automation, so guidelines are being drawn up for the purchase of equipment. Limiting the number of vendors is seen as a way of ensuring compatibility with existing equipment to allow a natural development as new products emerge.

These are the main results of a major research report\* in the US by International Resource Development Inc.

The system of preferred vendors favours the largest companies, which can offer a full range of products and the service and support demanded by large organisations.

Not surprisingly, IBM seems to be emerging top of the list of preferred vendors. This is being linked to its recent acquisition of 15% of PABX-maker Rolm.

According to IRD, IBM will be offering both LAN and PABX by 1984, thus completing its product range.

Ken Bosomworth, president of IRD, said: "IBM saw a one-in-a-generation opportunity to lock out most of its competitors from the large organisation personal computer and office automation business, but in order to do so it needed a really full product line, including PABX and LAN linkages."

Large organisations within the UK are reluctant to give details of their own guidelines. They do admit, however, that they are recommending that the purchase of office equipment should be limited to a few vendors.

The trend away from dedicated word processors is confirmed by a second report by Input. This report aims to highlight the difference between word processors and personal computers.

Keith Hocking, director of Input, said: "Word processors are becoming more like personal computers - the difference is very confusing."

The purchase of dedicated word processors is now thought to have been short sighted, but because of the money spent on installation it is unlikely they will be replaced very quickly.

\*PCs versus CWP's in the clerical workstations of the future, International Resource Development Inc.

## Iraq banks on Logica in £5m deal

by George Black  
LEADING British systems house Logica has won its biggest job yet - to provide £5 million worth of software for Iraq's nationalised commercial banks. And the contract has taken seven years to negotiate.

The job involves automating the Rafidain bank of Iraq almost from scratch.

Most of their work is still carried out manually.

A group of Logica staff leaves for the Middle East next week to start on the project, which will involve linking eight or nine Honeywell Level 6 machines to a DPSS mainframe in Baghdad on a distributed processing basis.

The problems in negotiating the contract derive partly from the Iraq government's insistence on buying hardware and software separately, and partly from the wheels-within-wheels at the country's central procurement agency.

But Logica managing director Len Taylor commented: "Everything takes much longer to arrange in that area. Four to five years would have been quite normal and this has just happened to take a little longer. There were those who

thought we should give up on it - especially when the war with Iran broke out. But in our type of business you have to pursue everything, including a lot of contracts which don't look particularly promising. If only a third of them materialise, you are doing well."

The task, which includes the retraining of dozens of the bank's staff, is scheduled for completion in 1986 with phase one to be finished after two years. But Taylor expects some Logica people could be called on to stay longer to tidy up.

The hardware is being supplied by the French Honeywell-Bull, the French government has just signed a massive loan to Iraq. Front office terminals will be provided by Olivetti. Logica has done a number of jobs in Iraq before and believes the government has a good paying record, even if it may be presently under strain which could cause delays.

Taylor did not think there would be any danger to staff in the project from the war; but said if there appeared to be a risk of it spreading into the area of the project staff could be evacuated quickly.



BAKER... "Computers can motivate children."

## Government gives £2.5m for aids in teaching disabled

by Caroline Burgess  
THE government is to spend £2.5 million on computerised teaching aids for 700 special schools for the disabled.

The move was announced by Kenneth Baker, Minister for Industry and Information Technology, to the British Association for the Advancement of Science.

The new money will come from the Information Technology Awareness Scheme.

"It has been shown that computers can motivate children in a way few adults can, and give them confidence by allowing them to achieve results independent of any human beings," said Baker.

Three schools in Scotland have already been established as resource centres to evaluate new equipment. These facilities will now be extended. The £2.5 million will be used to buy hardware and software for the schools.

Baker said the government already sponsored the development of microtechnology for the disabled.

The advantages for both the disabled and British industry were emphasised by Baker: "Today's developments for the disabled may be tomorrow's mass market products. Many companies have been afraid to take the risk in the less

obviously lucrative market for the disabled."

He added: "I am quite certain that some of the small-scale developments under way at present will sooner or later lead to successful new businesses."

Previous products developed under government funding include the Turtle, a toy linked to a microcomputer that responds to a child's commands and plays tunes, the Sound Bubble, which helps to teach co-ordination to disabled children, and the Concept Keyboard, a similar device for adults.

Department of Trade funding has also been used for research by Bristol University to develop a system to help the deaf learn syntax, and in an Open University project to help blind children read Braille.

Money is also being provided for buying 500 Vixel machines which print copies of telephone calls. The Telecoms Bill will contain extra provision to finance equipment for blind telephonists.

An electronic stimulation device has been developed by a small Welsh company to help paralysed people walk. Further trials of the system will now be funded by the government. According to Baker, paralysed adults often find a new interest in computers.

## SALES BRIEF

### Nixdorf wins Glasgow's £1/2m order

NIXDORF Computer, West Germany's biggest indigenous computer maker, has won its first UK order from a local authority. The City of Glasgow has ordered 16 8860 financial systems worth £500,000 for the collection of rents from the 180,000 council house tenants.

The order also includes 41 cash stations to be installed at counters and linked up to the Glasgow Computer Centre for overnight processing of data.

### Maritime buy

US MINI systems maker Harris continues its revival with a £100,000 sale of PABX digital telephone equipment to the National Maritime Institute. The new PABX links telephone exchanges at two sites and will be paid for by the government.

### \$15m orders

SUPERCOMPUTER and mainframe giant Control Data of the US has taken two orders worth a total \$15.7 million from a large US aircraft maker. One order, worth \$10.1 million, is for 85 update kits for existing fire control systems, and the other for 31 new computers.

### Telecom tests

HEWLETT-PACKARD has won a £3 million order from British Telecom for remote testing equipment. HP claims that 85% of the equipment, to be used in BT's Rates programme, will be made in the UK.

### Democrat sale

NEWCASTLE City Council has chosen the Democrat workstation, supplied in the UK by Decolt of Birmingham, to re-equip its network used for keeping details of house rents and repairs. The order, worth £120,000, includes 60 terminals, which will be hooked up to the council's two ICL 2900 mainframes.

### Spending control

THE Treasury is installing accounting software written by Package Programs to help control public spending. The packages - general ledger, financial reporting and accounts payable - will run on the Treasury's ICL 2966 VME computer at its Chessington computer centre.

### Ford link-up

FORD has bought two packages from UK software house Sclipco to enable a Cobol Data mainframe and a DEC Vax at the motor giant's Engineering Centre to link up with another Control Data computer in the US. The link-up is achieved by software and hardware that allow the Vax to act as a remote job entry workstation using the HASP protocol.

### Logging order

THE Central Computer and Telecommunications Agency (CCTA), which advises the government on public sector computer purchases, has ordered equipment to log telephone calls from Business Telecommunications Services of Surrey. After taking part in CCTA trials, BTS also won an order from the Scottish Office for equipment linking nine buildings and seven telephone systems in Edinburgh.

### College mini

PRIME Computer has picked up an order for a 2250 mini system on order for a 2250 mini system from Lowestoft College. The machine will be used initially for machine training in the Department of Engineering and Sciences but later will also be used by other departments.

## MICRO NEWS

# The Acorn Electron here at last

by Nuala Moran  
THE Electron, Acorn's home computer, was launched last week, but purchasers will have to wait until October to buy it. The price will be £199, and Acorn has emphasised it is not open to price cutting.

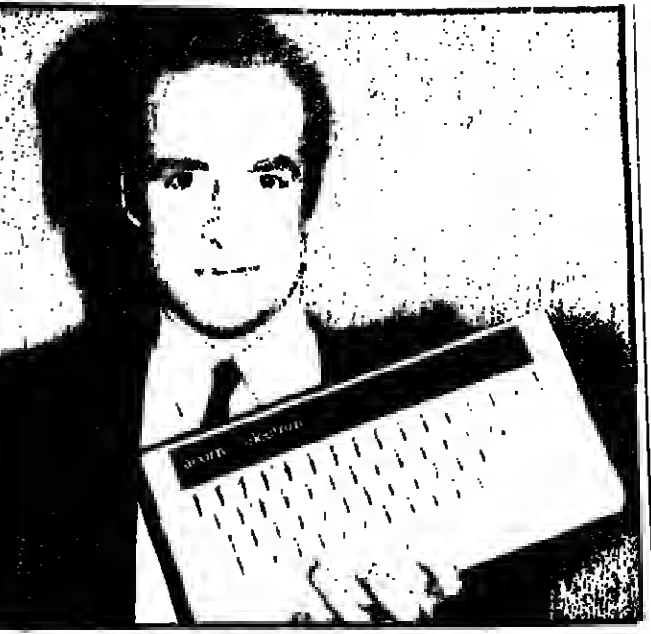
Next year Acorn will launch a business personal computer and a computer-aided design terminal. The PC will cost £900 to £2,500. It will be based on Acorn's BBC micro, which has already sold well to the business community, but it will have two processors.

Acorn has made a deal with W. H. Smith to market the Electron through 100 of Smith's shops. The Electron will also be available from

Acorn's dealers. Tom Hohenberg, Acorn's marketing manager, said he expected sales to reach 400,000 in the first year. A European launch is planned for 1984.

The Electron is compatible with the BBC micro, and according to Acorn, because many children use a BBC micro at school, an Electron at home means "the home will soon become as much a place for learning as the school".

Acorn stresses compatibility because at £199, the Electron is not much cheaper than the Commodore 64, which has twice the memory. The Commodore 64 is £229 but the price could be cut. And although the Electron's specifications are superior to the Sin-



CURRY... Keen to sell the Electron to women.

clair Spectrum and the Oric, it is double the price of these.

Chris Curry, Acorn's managing director, is keen to sell the Electron to women. "I would like to see it being used for working from home by women," he said.

The Electron has 32K RAM and a 32K Basic interpreter in ROM. It is based on a 2MHz 6502 processor and has a full-size qwerty key-

board with function keys. The price includes an introductory cassette demonstrating 16 example programs, a user guide and a Basic programming book.

Acorn has another big launch coming up. It will introduce the BBC micro into the US later this year to coincide with the screening on American TV of BBC series "Making the most of the micro".

## Mostek into 256k dynamic RAM market

US CHIP maker Mostek is moving into the 256K dynamic RAM market. But its first offering will not be aimed at the same bulk storage applications as those from the Japanese and US manufacturers that have already announced 256K products.

Mostek's part will follow the company's Bytewise devices and be organised at 32K by eight bits, making the parts more readily applicable to small microprocessor-based systems. Most other 256K designs are arranged as 256K by one bit.

"We will do a 256K by 1 version," says UK managing director Paul Mayes, "but we feel there is a large market for organisations like the 32K by eight." He thinks the still strong personal and home computer market will welcome the chips, which can fill the memory requirements of such products with just one or two 32K x 8 parts.

The Mostek device is not due in the US for another two or three months in sample quantities, and will probably arrive in the UK by the end of 1983.

## Korea to make Zilog microchips

by John Riley  
ZILLOG microchips will be made and distributed throughout Asia by the Korean company Gold Star Semiconductor, as a result of a \$5 million five-year agreement signed recently.

Gold Star will make Z80 8-bit microprocessors, with the Z80 family of peripheral support circuits, and will compete with Zilog in the Far East.

Zilog has been locked in a legal wrangle with the Japanese company Nippon Electric over alleged infringements of its patents, copyright and trademark for the Z80 chip, and is seeking a ban on Nippon Electric's PD780 chip.

Nippon Electric has said it would retaliate by asking the Tokyo district court to stop the import of Zilog chips, alleging they are copies of Nippon Electric's chips.

"We don't sell that many chips in Japan anyway," said a Zilog spokesman, "as they make it hard for us to export there, so we would be happy to exchange bans."

## Merlin wins contract for travel agents' automation system

by Nuala Moran  
AN exclusive marketing contract for British Telecom's Merlin Division to sell hardware and systems software has been formally announced by Future Technology Systems (FTS), the Scottish micro builder.

The FTS hardware is for Modula, a micro-based office automation system for travel agents. The deal means that the Modula system will be marketed, installed and maintained through Merlin's national sales and service organisation.

Modules was designed in a joint venture between FTS, the Association of British Travel Agents

(ABTA), and Tourism Technology Limited (TTL).

Peter McHugh, managing director of FTS, said: "I don't think any manufacturer has ever worked so closely with a trade association to give its members computer technology. The Modula development represents £750,000 in investment."

Under the deal with Merlin, TTL will develop applications software, worth £2 million over the two years of the contract. It will also train Merlin staff and customers.

FTS was set up by FTS in association with ABTA and a consortium of travel agents, the Travel Agents Consortium for Information Technology (TACIT) to develop the Modula software and market the system. Although Merlin has taken over UK marketing, TTL will still market Modula abroad.

According to McHugh: "This £5 million deal with Merlin is FTS' biggest sale to date, and it is a minimum two-year contract." He also confirmed FTS' strategy of selling to major OEMs.

FTS was set up three years ago. Last year it had a turnover of £500,000 which is expected to increase to £6 million in 1983. The company is about to open its third manufacturing plant in Scotland, and a design and development facility will be opened in October.

McHugh said: "We are just starting to export, and have recently closed a deal with a subsidiary of AES, the word processing company, in Holland. We are looking to get most of our business abroad in the next year."



McHUGH... "Starting to export."

Micro News is compiled by Robert Parry

## June dates for Software '84 exhibition

by John Kavanagh  
AN EXHIBITION dedicated to software has been launched by Business Press International, publisher of *Computer Weekly* and organiser of the Compex show.

The first exhibition, Software '84, will run from June 5 to 7 next year at London's Earls Court with about 200 stands. A conference backed by the National Computing Centre will run alongside the show.

The show follows the doubling of size of the Software Village every year since its introduction at Compex in 1981.

Software '84 will cover the entire software industry, from micro and minicomputer applications packages to mainframe systems software.

The show's main sponsors will be *Computer Weekly* and *Software*.

## User groups merger plan by HP

by John Riley  
THE two major Hewlett-Packard international user groups, for the HP 3000 and the HP 1000 systems, are to merge in January.

The directors of both groups approved the plan last week to all 6,500 members, who will vote on it this autumn.

Asked if the move was antipathetic to Hewlett-Packard's own plans to link the commercial HP 3000 and the technical HP 1000 computers as part of its internal compatibility programme, a spokeswoman for the group replied: "It is more to do with our own organisation."

"Both user groups have shared staff over the past two years, but have remained separate legal and financial entities. A merger creates efficient economies of scale. Secondly, it creates a unified association of HP computer users."

## Mystery UK machine is revealed today

by Claire Gooding  
SECRECY surrounds the launch this week of a new British machine with a bevy of operating systems and a remarkably low price. The machine is 68000-based and multi-user, and runs Unix System III, the Pick operating system and Pick applications generator System Builder, as well as the BOS operating system from MPSL, the O/S multitasking operating system, and Digital Research's CPM 2.2.

The system, due to be revealed in London today, was given no name in the full-page advertisement in a trade paper which announced the arrival last week.

Readers - and competitors - intrigued by the low price of £6,795 were treated to another dose of deliberate mystery when they saw the number displayed in the advertisement for more information.

A helpful man at the other end of the line admitted to being the managing director of the British company launching the machine,



The secret, low-cost machine will be unveiled today.

beat launch when it arrived in the UK, engineered by the same public relations consultancy now dealing with the Aston Technology launch. The man at the end of the phone would not admit to being Graham Gough, but threw out some heavy hints about his versatile machine.

"Enquiries have reached three figures from that one advert," he said, "and about half come from existing Pick users, which is very surprising, even to us."

The Pick operating system is a versatile, 16-bit, multi-user system from Dick Pick's Computer Works. It is enthusiastic following - thought to consist of over 20,000 users worldwide - is steadily increasing and there are plenty of applications already

available, unlike the main 16-bit contender, Unix.

Pick's main strengths are its "relational" language English, on top of which several applications generators have been built, and its ability to manipulate data in variable length records.

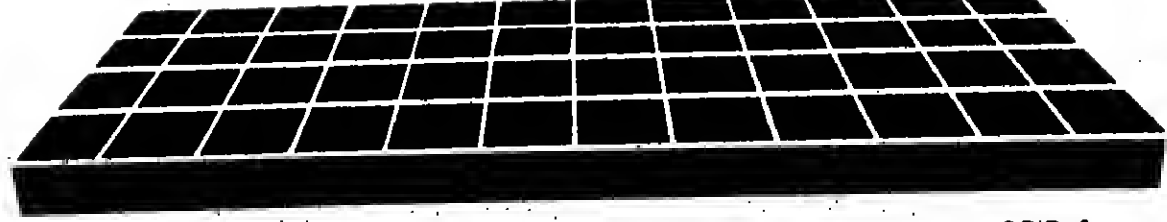
Because it uses a physical addressing, Pick takes some time to implement and is likely to be the "native" operating system of the new machine.

Pick has suddenly become trendy, helped by the arrival of 16-bit machines, in an applications-hungry market. A lookalike version for the IBM PC, Revelation, has also boosted interest.

Many manufacturers have adopted the system under a different name, but as yet there are few 68000 implementations of Pick: the Datamedia DM-932, Systems Management's CS9000, General Automation's recently-launched Zebra, and Perlec's 4000 all come from the US.

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## DG jumps on Unix bandwagon

MINI manufacturer Data General has joined the rush to supply a Unix implementation, starting with the Eclipse family. Unix System III has been adopted by Data General as an alternative to its own AOS/V5 operating system on the Eclipse MV.

"It is company policy to standardise," explained marketing manager Bill Cadogan. "The problem is that there are so many versions of Unix and in order to standardise one has to go at the pace of the industry. System III was chosen as the emerging standard."

By entering comparatively late into the Unix market, Data General has been able to leapfrog some other manufacturers who opted for the earlier Unix Version VII.

The Data General implementation, done in-house, will enable users to use the operating systems in tandem, swapping from Unix to AOS/V5 wherever necessary. UNIX/V5 - the name given to its Unix by Data General, includes the source code control system, an aid to development programmers, and the AOS/V5 C Compiler, which had been written by Data General to conform with the standards laid down by C originators Kernighan and Ritchie.

## Hogan raid on finance market

THREE contenders for the fast-growing financial applications market are joining up in a new joint venture company called Inter-Financial Software.

It will bring together banking expertise from Hogan Systems and insurance knowledge from Continuum, both Texas-based, as well as the securities experience of New York's Monchik-Weber.

This pleases Hogan, particularly as it has pipped MSA to the post in forging an alliance with the other two. Only last December MSA was looking to buy Hogan before the Dallas concern decided to go public instead.

What adds piquancy is that the men on this shopping spree, Hogan's Richard Warren and MSA's Michael Hunt, are old colleagues from Cincom. Both have migrated from systems to applications software.

Now Warren is saying that Hogan's long-term aim is to be "as

good as MSA across the whole financial spectrum". The objectives rest on this new triad which will have a collective annual turnover of about \$60 million, compared with MSA's \$100 million. It will also spread Hogan's interests from its IBM base into the minis of Hewlett-Packard, Data General and others.

For Monchik, it is the first step outside the US, whereas Continuum already has offices in Canada, and at New Malden in Surrey. Both have also recently gone public.

Hogan's announcement comes at a crucial stage for rival Anacom of Indiana, which plans to bring a \$2 million package to market next spring after considerable delay.

Anacom is reported to have raised more than \$20 million from two dozen sponsor banks including Barclays, to fund its multi-purpose financial package CIS, but



WARREN... "A million pounds is really very cheap."

hitches have recently caused shares to fall. Hogan is talking to all four UK clearing banks and hopes Barclays may yet switch systems.

Hogan's Warren admits it still has no British customer but says it will get one soon. He adds: "A

million pounds for such a system is really very cheap when you think it would take three or four years to develop in-house. And most banks are committing themselves to it for at least eight years. They've been using their batch systems for 15."

## Peterboro' takes pain out of JCL

by Claire Gooding

A SHORT cut around the complexities of job control language (JCL) has been found by Peterborough Software, best known for its payroll packages. Peterborough is supplying an "easyload" program with its software to take the pain out of creating JCL to link programs.

"We have a policy of supplying source code to our customers," explained general manager Nick Cooke. "It has advantages in terms of maintenance, but it means the programs have to be linked to installation. What we are doing is taking parameters from an embryonic JCL and generating all the JCL so that the programs install and test themselves."

Although the JCL program was developed for use with Peterborough's payroll, personnel and pension packages, Cooke says it could be used with any "embryo" JCL commands as a general purpose JCL generator. "I doubt if we'll market it as a product," he added. "It's not in our interest to make other software houses more professional and efficient."

## Spending check

MSA HAS added to its IBM mainframe financial applications with a project management program, CETS, the Capital Expenditure Tracking System, which can run on its own or with the firm's fixed assets accounting system. Managing director Dan Schmidt said it would identify problem areas before they led to overspending.

## Prime system

US MINI maker Prime has brought in an interactive application generator and database management system called Queo-IV. The system, supplied by Computer Techniques of Olyphant, Pennsylvania, serves up to 50 users.

## Sorcim package

A USER-FRIENDLY word processing package from Superole author Sorcim of California is to be marketed by ACT subsidiary Pulsar. ACT has recently signed a deal with Sorcim to sell its products in this country. Among these will be the new Superwriter, which checks all text with its 20,000-word dictionary.

## Finite addition

FINITE element analysis has been added to the range of services offered by Control Data's Cybernet bureau service. Control Data has bought the rights to the Argus finite element analysis program from Merlin, a US company specialising in engineering software. The Argus software is for sale or lease on a range of mainframes and minis.

## Triumph for IF

A SPREADSHEET program called IF, designed with multi-user systems in mind, is the newest addition to Triumph Adler's 1630 minicomputer offerings. The spreadsheet program includes all the "what-if" functions that allow users to calculate the effects of a decision on their financial strategy.

## Magazine sued for £500,000 over review of database

by John Kavanagh

MICROCOMPUTER software firm Bristol Software Factory is suing *Personal Computer World* magazine for £500,000 because of a review of the company's Silicon Office database, office automation and communications package.

It is also applying for an injunction against another UK firm, Microcomputer Business Systems, to prevent it using an allegedly misquoted version of the review in promotional material.

The £500,000 claim is also against Dr Cathy Lang, who did the review by comparing Silicon Office and five other database products.

Bristol Software marketing director Mike McDonald claimed the review contained 13 factual errors. It said, for example, that a read of 50 records took two or three minutes on the other systems and nearly 4.5 hours using Silicon Office. Bristol Software's own tests showed the system matched the other products for speed.

"The review is being quoted by other suppliers and it's become a hard battle even to get dealers to talk to us," McDonald said. "Our claim represents the business we reckon we've lost."

*Personal Computer World* editor Jane Bird stood by the review written by Dr Lang. "I am sure that Cathy Lang did her job properly," said Bird. "The reviews were done last August and it has taken Bristol Software a long time to make their objections."

Bristol Software's argument

against Microcomputer Business Systems is that its literature says the test was done using a Sirius computer. The article said a Sirius was used but added that the Silicon Office was run on a Commodore Pet, an eight-bit machine. PCW confirms that only a Pet version of the Silicon Office was supplied by Bristol Software at the time of the review.

Microcomputer Business Systems sales director Richard Temple said this was a genuine error. "I would be happy to change our literature. I have no wish to publish incorrect information."

He added: "It's a pity Bristol Software didn't just get on the phone to us about it instead of going to their solicitors."

## SAS into 32-bit superminis

SAS INSTITUTE is the latest to join the list of traditionally IBM-oriented software writers to diversify into the 32-bit supermini market.

Its package has been converted to run on DEC's Vax and Data General's MV series, with about 40 test sites due to receive the new products during September. Prime users can expect to get their version by the end of the year, it is promised.

Since 1976, when author Jim Goodnight decided to take the fruits of his PhD thesis out of academic closets and promote it on the open market, the firm of which

he is now president has targeted itself exclusively at the IBM mainframe world.

The package had had a strong following in universities where it had been installed on IBM/360s since the late 1960s, but the early addition of colour graphics helped to spread it broadly among bigger companies. This happened especially in the US where graphics were quickly accepted as offering more than a gimmick, making SAS the largest independent vendor of IBM mainframe graphics.

Arriving in Europe in late 1980, SAS found favour initially with chemical giants like ICI, Beecham,

Bayer and BASF.

In the last two years user ballots of thousands of SAS clients surprisingly revealed that their IBM 4300-series users saw the availability of SAS on parallel-running Vaxes as a priority. They were apparently being thwarted by a shortage of satisfactory, cheap graphics for use on their machines.

The adaptation from IBM Assembler and PL1 to a mainly PL1 and therefore portable system took 15 months of hard labour by about 200 technical staff at the North Carolina headquarters. By the end of the year SAS expects to have 500 supermini customers.

## Olivetti aims to make life easier for systems writers

OLIVETTI'S British subsidiary is offering a new deal for software houses to write applications for the US Stratus fault-tolerant machines which it began distributing in this country earlier in the year.

The object is to cut the risks of OEM agreements, according to Don Wilson, marketing manager for the continuous processing system CPS/32. Olivetti will encourage authors to convert their programs with a 25% discount on the hardware and will help to distribute the adapted packages

with machines it sells itself. Wilson added that it would also pay developers if their software assisted sales even if they had not bought a CPS/32 themselves.

The plan should make life easier for systems writers as well as providing a wider range of applications for financial managers, government, factories and service industries, he said. Olivetti will be approaching selected software houses but also invites ideas from anyone with suitable programs. Wilson said the strength of the

CPS/32 was that fault recognition and shutdown were handled by the hardware.

The unlikely marriage is now being seen as a central feature of Olivetti's policy, with a Stratus support team being built up here and a parallel operation in Italy.

The concept seems to be that boosting the Stratus will also boost Olivetti's traditional products, particularly in the financial systems market. The long-term is

to concentrate on upgrading to Motorola's faster 68020 32-bit chip, but Olivetti will stress to programmers that the applications are distanced from the machine and are not jeopardised by hardware changes.

"Other failsafe products can spray an awful lot of rubbish round a database in a second while the software is deciding if there is something wrong," said Wilson.

Software File is compiled by George Black

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SKAR... intends to expand the UK team.

## Norsk doubles profits as mini leaders suffer a slowdown

If the minicomputer market is dying out, no one has told the Norwegians as local company Norsk Data comes in with a record 100% profit rise for the half-year.

Based on rising sales in both the 16-bit and 32-bit areas, Norsk has clocked up a pre-tax profit for the half-year of 24.7 million kroner (£2.2 million) from 12.4 million kroner (£1.1 million) for the half year ended June 30, 1982.

The 16-bit Norsk 100, substantially aided by new software, has continued to make heavy sales gains, despite being in a market where leaders like DEC and Prime are encountering a big slowdown as top-end micros creep into the world of minis.

The Norwegians remain a growing force in Northern Europe, and the office systems software Novis, with user terminology in each European country's language, has increased Norsk's position in the integrated office field substantially, according to company chairman Rolf Skar.

## Rosy future for UK telecomms

TWO reports this week paint a glowing picture for the future of the telecommunications industry in the UK and in Europe.

The first report\* from City-based ICC Business Ratios says the prospects for Britain's telecommunications industry, already one of the most successful sectors in the country, look extremely promising on a number of fronts.

Slack output has had little or no effect on the growth in profitability of the best companies in the sector, says ICC, with more than half of the companies surveyed making a return on capital of over 20%.

The restraints placed on British Telecom by the government has had its impact on the major companies, though not noticeably so at the two biggest, Racal and Plessey, where overseas business has more than compensated for slower growth at home. Both companies have recorded sales growth of over 50% in the last years surveyed, 1981 and 1982.

Both have also maintained record returns on capital employed in Plessey's case 24.6%, and at Racal 27%.

Return on capital is one measure of how well a company is doing, but profits and sales remain the yardstick and those who did not seek pastures new outside the UK show it in their figures.

Standard Telephones and Cables, the now partly privatised



Plessey's board enjoys a record return on capital employed.

UK subsidiary of US telecomms giant ITT has recorded annual sales growth of just 14% in the three years since 1979.

This poor showing is a reflection of the status of a subsidiary maintained in a country almost exclusively to service the local market.

STC has been a major supplier to BT for years but would have found itself competing with other STC subsidiaries had it become too aggressive in its export policies.

After the two leaders Cable and Wireless managed a respectable annual sales growth of 18%, but much of this company's promise is still to come as it explores new commercial ground now that it is no longer a government-owned enterprise.

Standard Telephones and Cables, the now partly privatised

## Directors seek £1.3m, but warn of the risks

THE latest attempt to tap the City's insatiable appetite for high technology shares comes from Memcom International. The company, first registered in the UK last year as Biggleport, originated as a Californian operation, with most of its contracts in the Middle East, principally in war-torn Iraq.

Only one director is from the UK, and the other three are from the US and Saudi Arabia. The company is seeking to raise £1.3 million to fund its existing and future contracts, but deep in the prospectus is a short paragraph dealing with the destination of £400,000 of the proceeds.

In the course of work in Jordan and elsewhere, Memcom agreed to develop and produce an updatable microfiche camera called the Ovicom.

The patent owner of the camera is a company called Energy Conversion Devices, not otherwise identified by way of address or antecedents.

While the prospectus indicates that the £400,000 may not be the final funding required for the camera and warns that shareholders may be approached later for more money, the same potential shareholders and backers are given few details of what the Ovicom camera is, other than that prototypes have been around for a considerable time.

This implies that the device is not particularly new and there seems no reason why more specific details of both the device and the development have not been made available.

According to the prospectus, orders and enquiries for the Ovicom camera received to date would take up the first two years production.

The development of the Ovicom will be undertaken by a UK subsidiary of Memcom, called Memcom Electronics UK. The parent company does not appear to have entered into any guarantees to the subsidiary.

Memcom claims to be a major specialist in the field of information management systems, and most of its staff work on contracts

THE directors of Memcom International have, with due deference to the proprietors, drawn attention to the risks inherent in the company's business.

They say, in part, that the main risks are: "The cancellation or delay of one or more of the contracts could materially affect the projected volumes of sales and resultant profits."

They add that any war or civil strife would cause disruption and a substantial delay in achieving projected earnings. And that, if any suppliers run into delays this could cause increased staff costs and reduced profit margins.

Those risks are fairly obvious, though the fact that there is a war going on in Iraq should have been noted.

There are, however, other risks, which should have been noted as much attention. Almost one-third of the cash the company is proposing to raise will be spent in the UK on the technology and production of

cameras. Yet, while Memcom claims expertise in information systems, it has no track record in cameras.

To get a micrographical camera into production and on to the market, £400,000 is a very small sum. The company claims to have done all the arithmetic, but, if so, it could have shared the figures with would-be investors, as well giving details of the camera.

All this is to say no more than that Memcom has drawn up its prospectus less well than it might have.

It is, however, a way of saying that, despite the venerable names of City solicitors, Clifford Turner, and of blue-chip auditors Touche Ross, the prospectus is not quite a document on which to go into one of the more regulated markets, like the USM.

Would-be investors should heed the warning given by the directors of the company, and think very carefully before investing.

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## PLATFORM

Tarmie Williams is president of Sydney Development Corporation.



## Software start-up funds pose some special problems

IN A world where our lives become increasingly dominated by large, complex bureaucracies, there are fewer and fewer opportunities for an individual or for small groups of people to make a major impact on society.

It is particularly difficult for people with an entrepreneurial spirit to break into the closed ranks of the manufacturers of consumer products.

To take an example from the automobile industry, the last five years have seen the quick growth and even quicker demise of two attempts to produce highly sophisticated new marques.

It is generally agreed that neither the Bricklin nor the de Lorean DMX fulfilled any lack of technical competence or potential consumer appeal. Although the issues were complex, the common thread running through the stories of halted success was money; money to build an organisation, and research, develop, refine and market a product.

There are good counter examples. In the electronics industry we have seen a few start-up companies with exciting, but not necessarily revolutionary, ideas, become enormously successful.

The common thread in these situations could well be that money is needed in lesser quantities when the target product is very specialised or the industry is in its very young, formative stages.

The industry that I know best — the software industry — is very young, still in its infancy in fact, yet I know for sure that money is no less important than it was for Bricklin, de Lorean or Apple. The difference is in quantities.

To bring a new automobile to market appears to cost a few hundred million; a new computer hardware system perhaps 50 million.

I believe that a new and successful software firm, with a wide range of systems, commercial and consumer products, can be built with financial resources similar to those required for a new computer.

The conventional ways of financing a new business endeavour have not worked very well for the software field — at least not in the situations I know.

Banks and investment firms are wary of financing start-up companies which intend to make a product that cannot be seen or felt or measured by the usual and established criteria.

Even when, through persistence and hard work, money is raised to float the first stages of software development, much more capital will still be found necessary to establish distribution channels and mount an effective and thorough marketing campaign.

In the case of my own company, Sydney Development Corporation, a public share issue was set up right at the beginning, and

raised \$200,000. This was enough to finance a modest development programme for our first software product, but was clearly not enough for the kind of expansion of the product line we had in mind to make us a major force in the software industry.

Subsequent share issues raised another \$4 million. When dealing with sums of this magnitude, a large amount of time, effort and expense must be spent with stock exchanges and various regulatory agencies.

This is a great, but frustrating, learning experience.

Clearly we needed to find another method of raising funds if we were to expand our product line quickly. That innovative method was found within existing Canadian government legislation, which permitted citizens to invest in real estate, movies and natural resources. These investments were permissible as deductions from income, thereby providing the investor with an investment that reduced his income tax.

It required considerable effort to persuade government officials that software development was truly a research and development activity and should be treated as a tax-free investment.

The government, however, eventually agreed and we created Canada's first public R&D Tax Shelter Investment. The idea was new, and it worked, enabling us to raise another \$15 million in capital to continue our work.

There are three principal areas where software manufacturers spend their money: research and development; distribution and marketing; and customer support. There are many hundreds of good ideas for product development, but we have decided to concentrate our efforts on products which support a broad range of diverse customer needs within a few industry sectors.

Getting some of our products to the end-user has involved solving distribution problems that we don't think have been tackled before in the software industry. Some of these efforts are highly innovative and personally exciting for our staff.

These thoughts have been concerned mostly with the importance of financial resources to the success of a software firm. It would be unfair to conclude, though, that this is the entire story.

Money is merely the structure supporting an organisation which must be truly creative in its product ideas, its development, its marketing and its administration.

Money is only the facilitator, which allows people to be creative. It is creative and dedicated people who build major companies and excellent products which make their mark on society.

Tarmie Williams

## PROFILE

## Driving GA safely into the commercial sector

FROM August 1 General Automation, the UK subsidiary of the US minicomputer company, found itself with a new man in the driving seat. It also found it was selling microcomputers to the commercial market — something of a volte face for an industrial minis company.

Mike Long is the man with the responsibility for seeing through these changes, which are aimed at steering GA away from its doldrum days of 1980 when the company reported a \$16.5 million loss on a turnover of \$125 million.

At the moment Long is busy hiring salesmen to promote GA's break into the commercial marketplace with the Zebra range of

by Nuala Moran

Pick operating system micros and minis.

"I was beginning to think it was time I had a go at running things," said Long. "But if the commercial market hadn't been the thing that was going to happen, I think I would have left."

Long is hiring eight salesmen to cope with the demand for Zebra. And he expects sales will receive a further boost later this year, when a Xenix-based version of Zebra is launched.

"Good salesmen are hard to come by, and they are expensive," he said. "I would dearly like to do everything through dealers, but I'm realistic enough to know that's not practical."

"However, I can't afford to have salesmen selling one-off systems to small users. And we're not in the Digital/DEC league. We farm out



LONG: "GA has learned its lessons and got sorted out".

applications to software houses," he explained.

GA is to offer some off-the-shelf packages in the next 12 months, but, said Long, "we really still want to shift boxes and leave the hairy stuff to software houses".

A sales manager was expected to start work that morning, but he

rang to say he wouldn't be taking up the appointment. "I don't blame him really," Long remarked ruefully. "I have done that sort of thing myself."

Long joined GA six-and-a-half years ago as a salesman, and later on became sales manager. Just before that he spent 18 months trying

to get his own business off the ground, importing industrial micros from the US.

"There is a hell of a market out there but I was undercapitalised," he said. "I did have quite a bit of success, but it was too much work. Trying to run my own business didn't agree with me, so I decided to come back to the fold."

Before his go-it-alone phase, Long worked for several companies in the US including Westinghouse, Texas Instruments and Singer. He was brain-drained to America in 1963.

Now Long is expecting to put GA on a path to new prosperity with the help of the Zebra range.

"In 1968 GA was one of the seven dwarfs in the mini industry, but by the mid-1970s it had become all things to all men. The company did jobs because it liked doing them, not for profit," he said.

This muddled objective culminated in the \$16.5 million loss in 1980.

A three-year recovery plan was launched by a new US managing director, Len MacKenzie, in 1980. By the end of July 1983, GA was reporting only a small loss and had slashed its debts from \$50 million to less than \$10 million.

The UK subsidiary has always made a profit, though, and this is despite its dependence on the industrial marketplace.

"GA has gone through a bad patch," commented Long, "but it has learned its lessons and got sorted out."

"The company will double in size over the next two years," Long forecast, becoming firmly established in the commercial market place.

## DOWNTIME

## How now, brown cow?

THIS story concerns cows, sex, pigs and supermarkets (but not necessarily in that order).

A US manufacturer has discovered that by sticking a microchip into a cow, information on its wellbeing, identity and readiness for, *ahem*, making a bull's day, can be relayed to a microcomputer via the marvel of wireless telegraphy.

And there is more. The very same microchip (washed after use in the cow, it is to be hoped), can be applied to products in supermarkets, allowing automatic charging at the checkout and preventing shoplifting, as well as the far more pernicious curse of human checkout operators ringing up lower prices.

A further application for the chip is the electronic branding of pigs. It would appear that the



Bric the pig checks his computerised nametag. See first story.

practice of clipping tags to their ears or tails falls down (or more accurately off) when their inquisitive piggy tails chew off the extremity in question.

Isn't science wonderful!

## Friendly persuasion

SOMEHOW Computer Weekly has got itself on to the mailing list of a technology conscious book club. "Members friendly" — that's what we strive to be," says its brochure. "We use computers, of course, to

give you best and quickest service, but it's PEOPLE who handle your letters and queries. It's the human touch we believe in."

Who wrote their brochure, I ask — man or mouse?

## Palace revolution

BUCKINGHAM Palace has upgraded its high technology equipment with the addition of a Burroughs minicomputer. Its Press office spokesman was not amused by Computer Weekly's inquiries — perhaps they should have a trade press entrance next to the tradesmen's entrance — but was at pains to point out that the hardware was manufactured at the American company's Cumberland, Scotland, factory.

The Palace has bought from Burroughs before, but the latest purchase helps to confirm Burroughs as a "British" concern alongside the newly-naturalised "IBM UK". The royal seal of approval is also believed to have been awarded to "NCR UK", though we have not been able to confirm this with Michael Pagan.

The new acquisition is thought to be a B930 minicomputer costing about £30,000 for the central processor — probably between £40,000 and £50,000 including terminals, some of which are in the royal kitchens keeping a watchful eye on the east of garden parties and other entertainments.

The man responsible for the Windsor's home computers, is clerk of the royal kitchen, Savoy group chairman and sometime Lord Mayor of London, Sir Hugh Wontner. He is anxious to get the enhancements up and running for the family when they return from the hols in Balmoral.

Burroughs hopes they will be so delighted that they will give the "By appointment to HM, purveyor of hardware" tag — but HM can expect a pretty stiff note from R. Wilford who is to go that far.

## Just the ticket

BRITISH RAIL Southern Region, probably the world's largest working museum, is always on the lookout for new ways to help the passenger. Just the other day, it introduced new computerised ticket machines at Charing Cross in a move to reduce queues.

And as if by magic, the queues vanished on the very first day of use.

It was not, however, all down to the whizzo new computers. Some of it might have had something to do with the fact that a fire had knocked out all the signals at London Bridge, just down the line, resulting in the cancellation of all the trains.

Ghad

## Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, September 1, 1983

## A price war has been declared

THE shake-out has started. Big price cuts by microcomputer market giant Commodore, and similar moves by Hewlett-Packard and Osborne, marked the start of a price war.

At the same time it puts the writing on the wall for tens of microcomputer firms. Two UK firms are already on the point of liquidation and many others will be trembling.

It had to come. The industry has been saying for many months: "It can't go on like this." There are well over 100 microcomputer manufacturers and some sort of shake-out was inevitable. It was simply a matter of when.

The same happened in the calculator business. In the early days the number of suppliers ran into three figures — today there is a mere handful.

The shake-out is to be welcomed, especially by users, although some individuals unfortunately will suffer along the way. In simple terms it means they will no longer be bemused by "new" product launches, now running at several a month. There are only so many variations on computer design, so it is not the hardware that makes the difference but other factors, such as the amount of software available and the level of support from the supplier.

It is the amount of attention given to such detail that singles out the leading manufacturers and the acceptance of their machines.

So instead of facing a bewildering array of suppliers, users will eventually be able to choose from a select few products from well established manufacturers.

One thing is certain: those suppliers will be big and strong enough to develop and support products properly. After all, they will have to be to survive the price war.

## Re-think on jobs

PRIME MINISTER Margaret Thatcher and TUC leader Len Murray last week both put their faith in the leisure industry as a means of solving the unemployment problem.

That is not to say that the two agree on the source of the problem, or the possible solution. But there is a sort of consensus that there will have to be a radical rethink if the UK hopes to keep its population involved in pursuits more painful than the daily queue.

The crucial difference between the analysis of the two is that Thatcher sees leisure as a means of creating jobs, whereas Murray suggests it may be a legitimate pursuit in its own right. The latter is the bolder statement — and quite extraordinary coming from the leader of the trades unions.

An admission by trades union leaders that full employment in the traditional sense is no longer a basic demand is a radical step forward. It will not be a popular view down on the shop floor, but that is more a question of education and habit than of broadly based conviction.

Clive Jenkins, general secretary of the Association of Scientific, Technical and Managerial Staffs, has in the past suggested that the concept of full employment should be rethought. But his vision of the future has seldom been seen as more than a voice in the wilderness.

Murray, whose comments came in an interview with the *Guardian*, lends considerably more weight to the argument. If he and his colleagues can bring about a realistic debate on the future work patterns, there may be some hope that technology will bring prosperity; otherwise the fear that an elite of technologists will eventually run the country — with the rest of the workforce increasingly involved in meaningless activities — could become a reality.

Thatcher, who was interviewed by the *Director*, gave no indication that she is prepared to take the issue of work patterns head on. Her argument, at least in public, continues to be that new technology will create jobs.

To be fair, the leaders of the other parties have shown no more willingness to offer anything but old answers to what is a new problem.

The new technologies may in the long run create new jobs. But the danger of plodding on without a serious look at radical alternatives is a worrying prospect.

**1984 and all that . . .**

THIS week's example of the strange things people say about computers is from Timothy Rostrom, of London, who wins £5.

There's a joke you might see played on the wall above a computer. It goes: "To be in human — but to really foul things up takes a computer." Well, computers are in a position now to really foul things up like never before — especially for you and me, because we're on the receiving end like never before.

What happens here's now more information about us on what we do and how we do it.

She Magazines

## LETTERS

## Transaction telephones

I BELIEVE Dr Jones has missed (or failed to emphasise) two important factors for retailers in his article on transaction telephones (*Computer Weekly*, August 11).

1. It is important to realise that the transaction telephone in its present form produces primarily a burden on the retailer. The requirement is for all credit sales against Visa and American Express to be processed through the system, whereas previously only those sales breaching the established floor limit would have required authorisation. In my experience, this burden has entailed authorisation on an additional 75% of Visa/Amex transactions.

2. While some parallel processing may take place at the point-of-sale, the credit authorisation process is largely independent from the sale transaction at the EPOS terminal. In order to be truly effective the transaction telephone must "talk" to the EPOS terminal, or even be integrated within the terminal. With some judicious reordering of the sale transaction, we may then see the credit authorisation and sale processes being conducted in parallel.

Given the achievement of my second point, we may yet see a sales receipt produced by the EPOS terminal, containing all the details previously held on the credit sale voucher. It is the removal of the voucher and the manual authorisation process that will then yield the benefits to the retailer, in terms of savings in sales assistant/cashier time.

Only when these benefits can be demonstrated will the installation of Dr Jones' quarter of a million units be realised.

T. W. SCHOOLING

## Meaning of Muse

REFERENCE is made to MUSB in the article Report accuses pirate teachers (*Computer Weekly*, August 11). Although MUSB originally was Mini and Microcomputer Users in Secondary Education, our activities are now relevant to a much wider educational field including primary, further and higher education.

We would be most grateful if any future reference to MUSB could style us Microcomputer Users in Education.

LORRAINE BOYCE

Birmingham.

## Airing for DEC users

I TAKE exception to your arrogant belittlement of Decus, the DEC user society, in your Leader, Is DEC looking for an identity (*Computer Weekly*, August 18).

You say, "Decus, the DEC user group, has also had to catch up with the times — it held its first commercial group meeting in May of this year."

Our Commercial User Group has been in existence since 1975. It has run meetings and conferences on wide ranging subjects since then.

Decus, as policy, does not pursue differences with DEC through the computer Press, thus perhaps we do not meet the standards of notoriety that you set for user groups, but I assure you that we are "right up with the Times", even if your Leaders are not. Specific examples out of our current activity list include:

□ We are actively pursuing the

interests of 1020 members in respect of DEC's recent change of policy;

□ We annually take record a no-holds-barred complaints session between DEC's top management and our grassroots membership, and get written reports back on action topics — the DEC panel includes the UK managing director.

We do not allow Press at this session, because we feel it would destroy DEC's chance to be frank;

□ We contribute time and effort to the National Computer Users Forum.

DEC management decisions get as good an airing with users within Decus as I have personally seen within ICL or IBM camps.

ALAN BROWNE  
Chairman, Decus Publicity and PR Sub-Committee

It should have read Vax Commercial User Group, although we understand that it is even questionable. — Editor.

## Anyone for baseball?

PEOPLE within the computer industry will doubtless have noted by now that many of our influences stem from the United States.

In order to appear suitably mid-Atlantic we have managed to form a baseball team playing fixtures around the London area.

Having achieved a fair level of efficiency it seems it is now time for us to go forth and increase the challenge to the computer world. And to do this we would be happy to put up another Rair challenge trophy to be competed for by teams within the computer industry.

We would be happy to organise this ourselves although to make the market more interesting we wondered whether your journal may be interested in sponsoring the Computer World Series.

Any interested parties should get in touch with me.

ALAN CAMPBELL

Managing Director

Rair Ltd,  
6-9 Upper St Martin's Lane,  
London WC2.

Ed: How many people out there throw a good screwball? If interest is high enough, we might be persuaded.

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

## Information please

I HAVE almost completed a new book, *Computer Based Learning: Practical Methods for Microcomputers*, to be published this autumn. It is my intention for it to be up-to-date as possible so I would welcome information from suppliers of software (packages, languages, authoring systems) who would like to have their product mentioned.

Naturally, the book has to be selective, but I am anxious to include details of any new (within the last six months) products, particularly authoring languages, that would be of interest to microcomputer users.

I can be contacted at the address below, or at 0625 531035.

GRAHAM BEECH  
5 Alton Road  
Wimborne  
Dorset

Principal consultant

DMW Group, Europe.

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## WARNING: COMPUTER DATA Are Your Presentations a Pain in the Neck?

We all know the problem! Too many people straining their necks to see too few monitors. The audience loses interest and your presentation, exhibition or demonstration loses its impact.

The Reflex Data Projection System was designed specifically to present computer information in a clear and effective manner to large audiences. The 20 MHz video bandwidth can handle up to 132 char/line and presents a sharp P31 green image up to 10 feet across. At Reflex we can directly interface to any computer.

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"You can now leave the company - and take your pension with you".

# A plan to protect the pensions of jobhoppers

by Nuala Moran  
IN THE computer industry 15% of people change jobs each year. And this, of course, is one of the attractions of the industry - that it is possible to move around and improve your job.

But there is one very significant drawback. People who change jobs often find they have pension assets frozen in the pension funds of former employers.

New National Provident Institution (NPI), one of the country's leading pensions companies, has introduced a new scheme, Plan 32, to get round this problem.

Jack Fisher, marketing manager

of NPI, explained that the company had done a survey of the job market to find which areas had the highest staff turnover.

"We found that in the computer industry 15% of people change jobs each year," he said.

Plan 32 is intended to protect those changing jobs during their working life from the prospect of a reduced standard of living in retirement. What happens is that instead of a paid-up benefit staying in a company pension scheme, it is transferred to NPI and invested in an individual policy.

Any time someone changes jobs he or she can transfer money

from the company scheme to the NPI scheme.

This is much more satisfactory than leaving money frozen in the pension scheme of a previous employer, because it can continue to earn interest.

Fisher said that NPI had not done a full survey, but his impression was that the majority of computer companies had pension schemes because it was seen as a way of keeping valued staff.

But he emphasised that Plan 32 was not intended to encourage fly-by-nights. "People who have been in a job for, say, five years are more affected by moving jobs

when it comes to pension rights than people who move frequently.

"Those who change jobs very often are usually able to reclaim some part of the pension contributions they have made," he said.

The government is known to favour introducing schemes to allow people to move money from a pension scheme when they move jobs. Plan 32 was made possible because of legislation introduced under Section 32 of the 1981 Finance Act, which allows an insurance company to accept a transfer value from a pension scheme and invest it in an individual policy.

## Discovery of a solar system rewards team

LAST month's exciting discovery of what could prove to be another solar system was a well-earned reward for the team of hard-working programmers, analysts and operators at the Rutherford Appleton Laboratory in Berkshire.

The discovery was made by analysing a routine day's data from the Infrared Astronomical Satellite (IRAS) launched last February to make a map of the sky using the infra-red radiation invisible to the eye or to conventional telescopes.

IRAS was poking its infra-red eye around the vicinity of Vega, one of the brightest stars in our heavens, and found a disc of dust stretching out from the star twice as far as our own solar system goes.

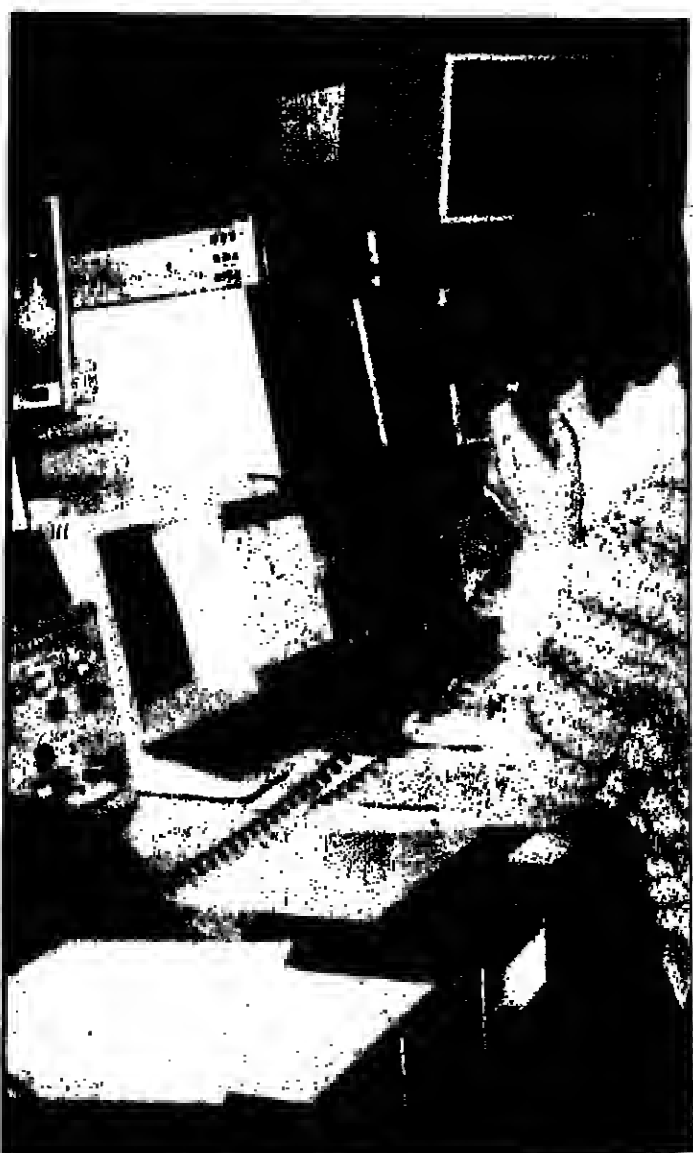
The presence of so much dust suggests to astronomers that there could be bigger celestial objects around too. Such objects would not emit enough infra-red radiation to be detected by IRAS, as their surface area is less than that of all the dust particles combined. But astronomers believe there is no dust without rock - at least in this case.

The discovery was a surprise for

two reasons. First, it has become unfashionable to believe that there are other earths in the galaxy, or in the universe for that matter. If the discovery is confirmed by careful scrutiny of the dust from conventional telescopes on the earth's surface, such thinking will be reversed.

The discovery was unexpected, partly because IRAS was sent up not to look for planets, but to look for cool stars - stars not hot enough to emit visible light. The idea was to build an atlas of these cool bodies covering the whole sky. Planets were definitely not on the menu, since they are too small to be detected by IRAS. But astronomers had not reckoned with the tell-tale dust.

This is good news for five of the 10 operators placed on contract with the IRAS project last February by KPG Computer Services. The satellite was due to expire in September when it should have run out of the helium needed to keep the telescope cool. But it now looks like staying in service until January, which means an extension of the contract.



The Rutherford machine room... Is there life in the vicinity of Vega?

## Notepad acts as a journal

SCIENTIFIC journals often have a small circulation, and add a large cover price. They are also often revised from comments and corrections submitted by readers.

These properties make scientific publications ideal candidates for computerisation. A three-year-old experiment to produce and use a scientific journal at Birmingham and Loughborough Universities has proved this point. The 50 users of the system have been able to submit draft copies of papers, edit them, and add marginal notes to text.

The system, called Notepad, is hosted by a DEC 20 computer at Birmingham University and controlled by a team at Loughborough.

The facility for users of Notepad to hold running discussions and grow scientific papers interactively has raised the ugly issue of copyright: who owns the paper?

There is, however, no reason why the situation need be any different from at present with written papers, where either there is one original author and a list of references, or several co-authors.

## PUZZLER

THESE numerologists are always finding new things to delight the mathematical "palate". Latest offering from the boffins is the fact that only one four-digit number exists that produces the same four-digit group at its end when squared. In other words:

ABCD x ABCD  
Can you find this unique number before turning to page 47 for the solution?

## Tops can help you sell

IF you are in your early thirties, and redundant or fed up with your job, then Garth Spiers could help. He runs a 12-week Tops course in computer salesmanship at the South Bank Polytechnic in London.

"Twenty-eight, 30 or 35 are excellent ages," Spiers said. "People of this age generally have a family, so they are hungry and have high job commitment. People of this age are the easiest to find jobs for, Spiers claimed. But the course has proved less successful for younger people, especially the few Spiers has taken on from university. "It has something to do with work mentality," he said. "People at university are spoon-fed."

The first salesmanship course finished in May, and since then 15 of the 20 on the course have found jobs. There were some older people on the course too, including a printer of 55 who had been made redundant. "He was at a very low ebb," said Spiers. But he is one of the lucky ones, and now has a job as a sales manager for a printing company. There was a need for someone with experience of micro, as the company was computerising its print operation.

Most of the jobs found by people on the course involve microcomputers, said Spiers. But a few of the jobs are outside the computer industry.

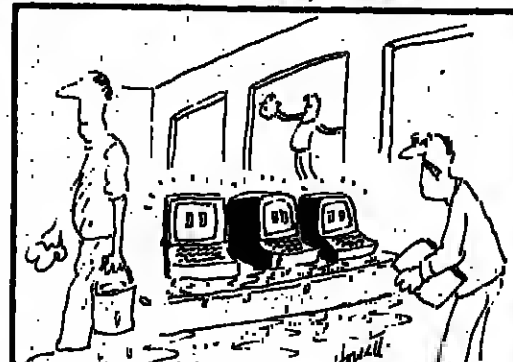
"Because there is a large emphasis on the course on personal development, some people jump at jobs per-

pheral to information technology," he said.

But a balance must be kept. "If everyone got jobs outside IT, the government would not spend the money," said Spiers.

The course is open to technical people who want to learn how to sell, or to salesmen who want to change to computers. No particular qualification is needed, but Spiers insists on some business experience.

He can afford to be choosy. More than 100 people applied for the first course, and there were 80 applicants for the second, which has just finished.



## Programmer joins a recruitment agency

CONTRACT programmers are often lured back into permanent work when they click with the company in which they have been assigned. This state of affairs is clearly not to the liking of the contract recruitment agencies, which are constantly losing their best people to client companies.

But contract programmer Roy Hills moved against the tide by joining the agency that found him work. Hills is now the programming specialist for the young agency InterCity Consultants, which last autumn was one of the first firms to move into the World Trade Centre near London's Tower Bridge.

By hiring Hills, Stephen Trigg, head of InterCity, has added the last bone to his skeleton of staff. Like other agency bosses he believes that overheads must be kept as low as possible to succeed in a crowded market.

"We needed someone with programming and technical experience," said Trigg.

The company hopes to make up for the loss of experienced contractors who go back to permanent work, start up their own businesses or negotiate work directly with clients, by fishing hard for first-time contractors.

Trigg said this did not mean his company was peddling appren-

tices, because the first-time contractor will often have more than five years' experience of permanent work. Indeed gone are the days when a Cobol programmer with two years on the bench could pick up an easy first contract.

The agency was set up last year in Leeds. But London is the place for an ambitious young agency, Trigg asserts: "It is more competitive, but it comes down to service, personal contact at the end of the day."

The agency now has almost 60 contractors at work.

Trigg aims to keep up with the competition by bombing in on vertical markets like real time military applications. But he wants to keep his eggs in several baskets, believing it is dangerous to concentrate on a single vertical market for simulation systems, which crumble with the recession in the aircraft industry.

Trigg hopes to win new customers by competing with software houses for fixed-price work. This means taking control of a project and hiring people to write the software.

Workplace is compiled by Philip Hunter

## PEOPLE



■ Sue Kelly, formerly senior contracts consultant with Goldsmith Computing, has been appointed contracts manager of Bellman Computing, based in Huddersfield.

■ As software sales executive of Memory Computers, a London systems house, David Wight will be responsible for selling tailor-made financial and engineering software for Prime minicomputers. Before joining Memory he worked for a London-based software house.

■ Stirling Robertson has joined Dialogue Distribution as a sales engineer, covering Kent and East Sussex. He has been involved in the electronic component distribution industry for ten years, and before joining Dialogue was Intel product manager at Jernym Distribution.

■ Rediffusion Computers has appointed Derek Strath as financial director. He joined the company in 1978 as financial controller, having previously worked for five years for AEC-Leyland Vehicles in a similar position.



■ Nixdorf Computer has appointed David Banks (above) as its first European manager, Supplies Division. He was previously manager of the Supplies Department of Nixdorf's British subsidiary company Nixdorf Computer Ltd, for four years. Banks entered the computer industry when he joined Nixdorf Computer in 1977 as a supplies salesman. He was appointed as manager of the UK Supplies Department in 1979.

## DIARY

SEPTEMBER 5-7  
Computer Appreciation is a Control Data course for non-technical staff. It will be held at the Control Data Institute, London, and costs £345. Details from Sylvia Lyons, 01-240 3400.

SEPTEMBER 5-16  
Part one of the Urwick Management Programme, called Coping with Change, takes place at the Urwick Management Centre, Slough. The course is run in conjunction with a second, two-week course called Getting Results. Fee for both is £1,600. Several other courses have also been set for this course and many other management development and training courses. Details from Urwick, (0753) 3411.

SEPTEMBER 7  
Treated and Telesoftware - a Technical Briefing for the User, is a course organised by the Institute of Information Scientists. It is to be held at Manchester Polytechnic from 9.15am to 5pm. Cost is £20, including VAT. Further information and booking forms can be obtained from G. R. Turner, CBA-GRIGY (061) 872 2121.

SEPTEMBER 14  
ISS Northern Branch is holding a seminar in Manchester on micrographics. Cost is £15 for members, £18 non-members. Further information from A. J. Oulton, (061) 228 6171.

SEPTEMBER 17-21  
Structured Fortran is a workshop for personnel new to programming. It will be held at the Control Data Institute, London, and costs £375. Further details from Jackie Barclay, 01-637 2171.

SEPTEMBER 19-20  
Network Protocols is being run by Monadnock International Management at Development at the Royal Garden Hotel, London. Details: Annabel Hartog, 01-262 2732.

SEPTEMBER 19-21  
Network Design is a seminar run by Frost & Sullivan. It takes place at the Mount Royal Hotel, London, and costs £425. Details: Carolyn Budd, 01-486 0334/5.

The Advanced Cobol workshop for programmers with some experience in Cobol takes place at the Control Data Institute, London, and costs £275. Details: Jackie Barclay, 01-637 2171.



■ Richard Wadman (left) sales and marketing director of Dragon Data, presents World Champion Mirror dughy sailors Dave Sherwin (centre) and Neil Salmon with the Dragon Trophy. Sherwin and crew member Neil, both from Essex, won the title during the Mirror Dughy World Championships, held at the Humber Yacht Club, Swansea. The two sailors dominated the week-long event, winning four out of the six races in their boat 'Freckles'. Dragon Data sponsored the event and a Dragon 32 home computer was used as the official method of recording results and calculating placings.

■ Instem Computer Systems has named three more directors. The company was acquired earlier this year from the US-based Kratos Inc by a consortium including British engineering group Dobson Park Industries, Cidbank and the management team of the former Kratos Computer Systems, named as directors of the new company. The three further board members are John Haine, 38, director manufacturing and service, who has been with the company for 11 years, following periods with ICL, ITT Germany and GEC; David Sherwin, 26, the finance director, who joined the company in 1973; and Alan Wyatt, 38, projects director. He has been with Instem for 13 years.

■ Gordon Mackay has been appointed European financial controller of Alpha Microsystems (GB). He comes from Lerraset where he spent most of his time with the Stanley Gibbons International subsidiary as group chief accountant.



■ The Byteshop, announces the appointment of Peter King (above) as managing director of The Byteshop Group. He was previously local director of The Byteshop in Manchester.

■ Peter Russell has joined Mostek UK as boards and systems field sales engineer. He will concentrate primarily on servicing the North and Midlands.

■ The merger of OTL and Data Recall has resulted in more regional offices, several new sales appointments and the recruitment of additional sales and customer support staff. OTL has added extra Data Recall offices in Bristol, Harrogate and Birmingham plus training and office facilities in Bookham, Surrey to make a total of 15 UK locations. Charles Boyle who has been appointed director of national accounts, has held senior sales positions in Data Recall for the past six years. Richard Ash, manager, Southern region, is to be responsible for sales and support offices in London, Bookham and Bristol with a team of 30 staff; John Skeffington has been appointed manager, Northern region, responsible for sales and support offices in Harrogate, Glasgow, Birmingham and Salford with a team of 25. He joined OTL from ICL in 1981.

■ Dave Phillips, 39, has been appointed a senior consultant with CMG Information Services. He worked for CMG until 1977 before joining the company's Belgian subsidiary in Brussels where he was responsible for special financial systems.

■ Prime Computer (UK) has appointed Geoff Leary as distributor programme manager, based at the company's Milton Keynes office. He will lead a team of distributed business managers who deal with the company's sale of computer systems to third parties for further applications development in specific end user markets.

■ Computing Techniques of Billingshurst, Sussex, has made three new appointments to the sales staff. Fred J. L. Frazer, who becomes UK sales manager, joins from Bell & Howell, where he was for nine years a senior sales and applications engineer. Affen H. Wilson joins as product manager, digital panel meters. He was previously technical sales executive with Trumeter Co, Manchester for three years, and sales manager for R. C. Arnold Engineering, Redhill, for two years. Robert Davis moves within the company to sales from the position of chief of test and service.

■ Dave Ellis has been appointed UK customer engineering manager for Hewlett-Packard. He was previously HP's CB manager for South-east England.



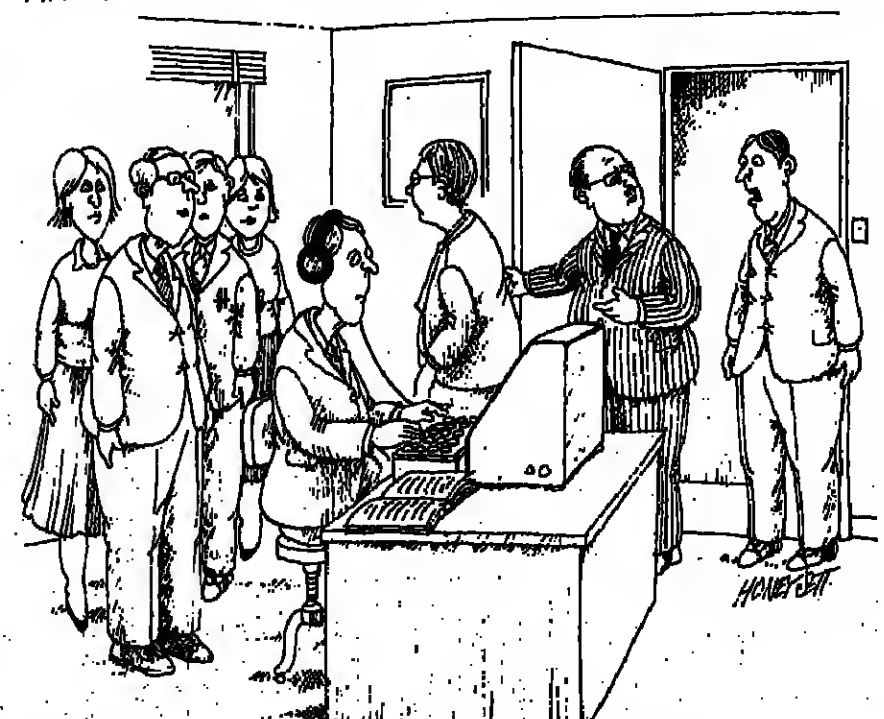
■ John Freer (above) has been appointed general manager of Standard Telephones and Cables' Information Terminals Division and a director of the management company STC Telecommunications. He was previously general manager of STC Business Systems' Communications Terminals Division. He has held senior positions with Ferranti Computers, GEC Computers and Automation, ICL Computer Peripherals and ITT Gied.

■ Elected vice-president (technical) by the Council of the BCS is Donald Davies, a deputy chief scientific officer at the National Physical Laboratory. He has been involved in computer research, development and application since 1949 when he joined NPL to help build the ACE Pilot Model computer. He received the BCS Computer Award for technical merit in 1974 and was elected a Distinguished Fellow of the Society in 1976.

■ Brian Greenway returns to the US with General Electric Professional Services Company to join a project team based at one of the many city offices. Tim Gibbs, until recently with Molins in Deptford, has joined General Electric Professional Services Company and will shortly be returning to the US also to join a project team.

■ Dave Ellis has been appointed UK customer engineering manager for Hewlett-Packard. He was previously HP's CB manager for South-east England.

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# PRINTERS

Amid the euphoria surrounding the continuing price cuts on micro, one salient point is often missed - the processor and its software may be attractively priced, but a halfway-decent printer could set you back by two or three times the amount spent on the micro.

Although it is the computer that grabs the attention, without a printer it is virtually useless for business purposes. Despite increasing use of online systems in large data processing installations, demand for printers from small businesses has doubled in the last year.

Between 170,000 and 200,000 units were imported in 1982 and, if current trends continue, imports will be a record

400,000 in 1983. The UK had a trade deficit in printers of about £49 million for the first five months of this year.

There is a staggering diversity of printers on offer: from the humble teletype, of which many are still in use, through daisywheels and line printers, to matrix devices, lasers and ion deposition printers capable of printing over 200,000 lines a minute of excellent quality - at a price.

There is a limited demand for high-volume lasers. It is not worth investing £200,000 or more on large-scale laser equipment unless at least three million pages a month are produced. But economy lasers aimed at the word proces-

sing and small data processing user are becoming available from several manufacturers.

It is unlikely that lasers will ever compete directly with daisywheel and matrix printers on a cost per unit basis, but high resolution, a 2,000 line-a-minute capability, and a relatively low price will tempt many users.

Today's printers incorporate a high level of new technology and in-built intelligence, and this hitherto conservative branch of computing has become one of the most innovative and competitive. Innovation, and rivalry between manufacturers, is bound to lead to cheaper, better products.

## Technology brings more options for the business user

Greater speed, lower prices and high quality will intensify competition in the printer market, says Della Bradshaw in this overview

WHAT types of printer are people going to buy for their computers? Will dot matrix printers and daisywheels continue to dominate or will users switch to lasers and thermal printers?

The experts cannot agree on an answer. One recent report predicts that the dot matrix area printer will be in greatest demand, because it is cheap.

Another report published at almost exactly the same time says that laser printers at prices under £8,000 will be all the rage in a few years' time, though no one has yet produced one at that price.

What is certain is that, as the number of computers increases, the number of printers will increase as well by up to 25% a year for the next three years or more, with the prospect of sales tripling within a decade.

The main growth in computer sales will be at the lower end of the market - in desk top and home computers - so dot matrix printers will remain popular. It is likely that nearly 300,000 will be

sold in the UK in 1986 - nearly three times as many as in 1981. Dot matrix printers have minute needles in the print head, which are fired at the ribbon to form dots. The more dots, the higher quality the print. Cheap printers have a matrix of five by seven dots. They are legible, but there are problems with letters such as p and q, where the descender is not always clear. The best matrix made is 9 by 14 but a matrix 24 dots in depth should be on the market by the end of the year, and at least one firm says it will make a matrix 36 dots deep.

To improve print quality some printers make two or more passes over the same line, so that the gaps between the dots are filled in with more dots. These printers are often referred to as near-letter-quality printers. (They should not be confused with the bi-directional printers, which are printers that can print from either edge of the page.)

The biggest problem with dot matrix printers is noise. Some companies make special efforts to produce quieter machines. Andex's Series A DP-9500A and DP-9501A printers are claimed to operate at less than 55 decibels. Speed and reliability are most important. Typical speeds for dot matrix printers are 200 to 300 characters per second (cps), compared with 30 to 40 with daisywheel printers. If the printer can produce both DP and near-letter-quality printing, the latter will be slower - probably about 100 cps.

Big names in dot matrix printers are Diablo, Newbury Data, and Zenith Data Systems - a US company, which recently decided to manufacture in Ireland for the European market. But Japanese companies, including Epson, Brother, Ltd and Mitsumi, dominate the lower end of the market.

Mitsumi first demonstrated its dot matrix printers at Compec last year. The MC2100 and MC 4200 offer pin-addressable graphics, 167 character set and touch-sensitive control keys. As for reliability,

Mitsumi guarantees that its nine-pin head will produce at least 100 million characters before it breaks down.

Daisywheel printers are meeting stiff competition from the better dot matrix printers. But daisywheels are best for top-quality documents as required by solicitors, for example. The daisywheel was designed to replace the golfball printer, which is too slow for most computer applications. The letters are on the ends of spokes attached to a central hub. The spoke is flexible and, when it is hit, it makes an impression like a typewriter key. First made of metal they are now usually plastic, the characters themselves being in a harder plastic than the spokes, for durability.

Like a golf ball, the daisywheel must be changed when a change of characters is needed, whereas for dot matrix printers only some extra RAM is needed to program in a new font or range of characters. Usually there are only 96 characters on a daisywheel.

Daisywheel printers are fast enough for word processors but these account for only about 10% of all uses of printers, and it is unlikely that the daisywheel will be able to stave off competition from the dot matrix printer.

The main question at the lower end of the market is: Are users prepared to pay more for a daisywheel, and sacrifice speed, for the sake of higher quality?

Diablo, Quime and NEC lead the daisywheel market, with Ricoh and typewriter manufacturers, such as Olivetti, Olympia, Triumph Adler, Smith Corona and Brother, strongly competing.

Brother is a good example of a typewriter company that has gone into printers. It has been exporting daisywheel printers to the UK for less than a year, but is already selling 500 a month. UK sales director Jim Kilmer claimed that by next year Brother would have the biggest printer marketing operation in the UK.

Thermal printers are becoming popular because they make no noise. They cost under £1,000, and operate by burning away the aluminium coating on special paper to reveal the paper's black core. The disadvantages of thermal printers are the need for special paper and its size, usually allowing a maximum of 40 characters per line.

The thermal printer is popular mainly for microcomputers, and

thermal printers are becoming popular because they make no noise. They cost under £1,000, and operate by burning away the aluminium coating on special paper to reveal the paper's black core. The disadvantages of thermal printers are the need for special paper and its size, usually allowing a maximum of 40 characters per line.

The thermal printer is popular mainly for microcomputers, and

**One of the main advantages of the daisywheel over the dot matrix printer is the lack of noise. This is a reason why other non-impact printers, such as thermal printers, are becoming popular.**

Sinclair's is probably the most popular model.

For larger computers there are band printers. This is now the main method for line printing. It uses a character set on an easily changed metal band and operates at about 1,000 to 2,000 lines per minute. Several firms, including ICL, offer band printers as a standard peripheral on their medium and larger computers.

Ink jet printers, which use tiny droplets of ink to form the characters, have one big advantage over other printers - they can print in coloured inks, without the operator having to change the ribbon. They are fast, because the work is not slowed down by the mechanical inertia of dot matrix or other impact printers. They are relatively expensive, but Canon has recently introduced a model at under £600, and other firms may follow.

Another fringe product in the printer market is the magnetic printer. Honeywell Bull markets one in France, which operates at about 6,000 lines per minute and gives letter quality.

Most revolutionary is the laser printer. Still rare, it operates by burning a row of dots on a sensitised drum. These dots are then transferred to ordinary paper electrostatically, as with a photocopier.

Laser printers can cost as much as £100,000 and are used only for very big computers or by firms which need a big output, such as printing bureaux.

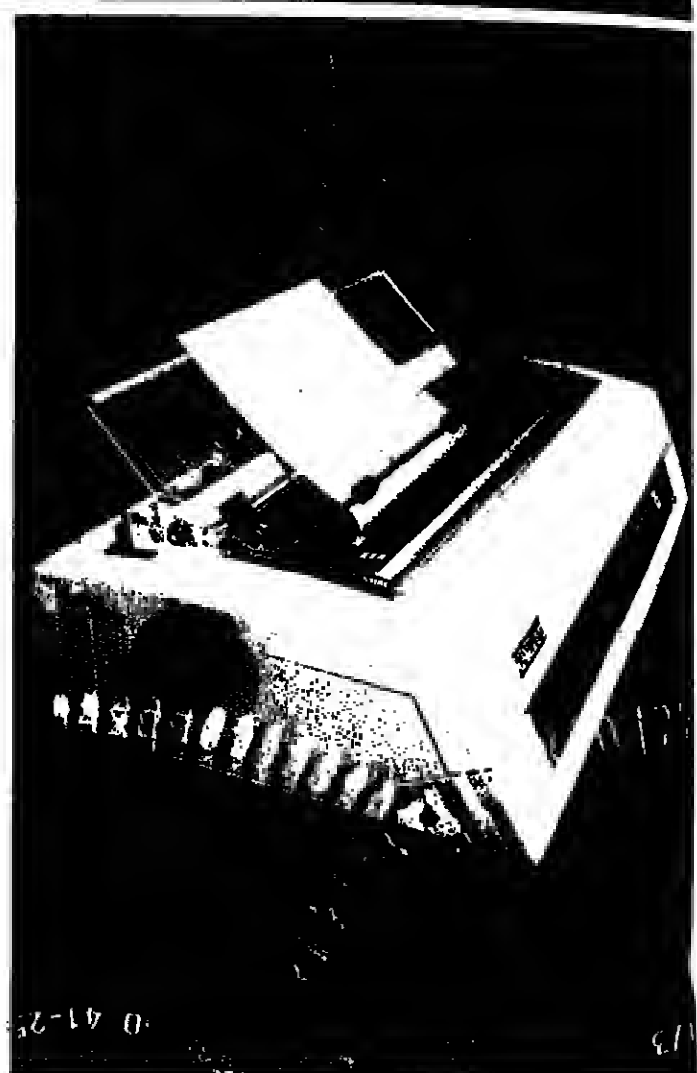
Until recently laser printers have been available only from large computer manufacturers and retailers, such as Hewlett-Packard and ICL. But earlier this year a £10,000 laser printer was introduced by Lombard Services, and it is thought that smaller and cheaper laser printers will be flooding the market in the next few years, especially with the introduction of 256K chips.

General users will then have access to 900 line per minute printers, which give up to five million dots per A4 page.

An alternative is the ion-deposition printer from Check-Tech of Basingstoke. Its Check-Tonic printer places a charged pattern on the dielectric surface of the image cylinder. The image is placed as a series of dots, each in a way similar to the scanning of a TV screen, at a rate of six megadots per second. The cylinder rotates through 1/240 of an inch and another pattern is deposited.

Then the rotation of the cylinder brings the charged image into contact with a toner brush, and toner is attracted to the charged areas. The toner is then transferred to the paper and fixed. Finally, the cylinder is cleaned in preparation for the next charge.

Up to six font sets of 64 characters are available to the user at one time, stored in EPROM. The system can also store digitised logos and signatures.



The ubiquitous daisywheel - top quality but slow.

## PRINTERS

# Daisywheels get the needle from high resolution matrix

Just as William Caxton's printing press presented a serious challenge to scribes of his day, multi-media printers pose a threat to established printing technologies in the 1980s, says David Casey

WITH products as diverse as golfball typewriters and electronic typesetters, the British printer market appears to lack a coherent identity. Suppliers maintain that there is no single market for output devices, as a 7x5 dot matrix printer little threat to a manufacturer of 2,000 line per minute chain printers. This observation may have been true in the past, but these complementary product groups now represent divergent technologies in a convergent marketplace.

When data processing was an activity remote from the executive and his or her secretary, the familiar green listing paper with its tractor-feed edging was accepted as the only method of generating information in hard copy. If the data was a component of a text-based report, columns of figures had to be copied laboriously on to a typewriter.

The innovation of the word processor did little to ease the burden: the early standalone machines were not able to communicate with more sophisticated computers.

The current trend towards integrated business systems and office automation is proving the critical factor in printer activity. While the flow of information processing power has been falling logarithmically over the past five years, printers able to achieve an aesthetic standard of output have remained relatively expensive. Quime and Diablo daisywheel machines, for example - the successors to the golfball printer in letter quality applications - are often more expensive than the processor unit of many microcomputers.

Apart from cost, letter-quality devices are inherently slow and therefore unsuitable for printing drafts of material for correction before final output. Typical daisywheel printer speeds are between 25 and 50 characters per second (cps) - twice the speed of the most sturdy golfball printer, but a snail's pace compared with a line printer.

The business systems market is perhaps the greatest stimulus to the development of multi-media devices, able to meet the demand for high-speed drafting and letter-quality reproduction. As the challenges of the information technology marketplace, these printers switch instantaneously from dot matrix to typographic quality to medium-resolution graphics - and back again.

Unlike a conventional dot printer, with its rectangular matrix of points, the multi-media rosette generates its image from a single row of needles. Each pass of the head lays down part of an image; subsequent runs with the head fractionally displaced improve the output quality at the expense of speed.

In building up a character set from multiple passes of the head, a needle matrix printer is not subject to the same restrictions on typestyle as other daisywheel or dot matrix printers. Provided there is sufficient capacity in the printer's on-board memory, several typefaces can be held simultaneously - for output, within a single line of text if required. More than one character set can be accommodated, so that a bilingual text in Roman and Greek alphabets can be supported by a single printer.

Introduced to the UK almost four years ago, the Sanders Technology series of needle printers is one of the most sophisticated of the multi-media machines on the market. The S700 printer can emulate an increasing range of typefaces in characters up to about a centimetre in height.

Single-pass character sets at the lower limits of legibility are generated at up to 390 cps (about 4,500 words a minute). What the manufacturers describe as "intermediate quality" comes off the machine at 102 cps in two passes, while letter-quality printing takes four passes, dropping the speed to between 30 and 50 cps - the upper end of the daisywheel range.

Real Time Printers of Camberley is a Sanders distributor that has developed its own software routines to digitise typefaces: the early needle matrix printers had met the same resistance as the Spinwriter and daisywheels - a limited selection of typefaces.

Real Time's managing director Mike Johnson outlined one benefit that has come from in-house digitisation. "Although the manufacturers claim 300 cps, we have been able to develop a 500 cps font. Working with a pitch of 20 characters to the inch, the output is built up from six of the seven needles in the head."

Typographic quality at the 500 cps level is minimal, with descenders (lower case j, p and y, for example) taking a single row of dots. Conceding that this face has limited applications, Johnson added that there is a higher quality

version made up from four passes, but at only half the speed. Generating their output from bi-directional passes of the printing head, the Sanders machines run at either 33 or 66 cm a second. They have to maintain their precision despite stopping, reversing and accelerating back to full speed in a 1cm buffer zone.

Johnson described some of the technical problems that the designers have had to overcome. "There has been extensive research into the drive circuits for moving the head across the paper and fixing its vertical position. The needles are controlled individually - their firing can be delayed or advanced to make sure they all strike at the same time even if they are not all perfectly in alignment within the head."

Driving the printing head on a needle matrix is far more difficult than with a conventional dot matrix or daisywheel. It takes only a single command, for example, to select the correct position for the spinning print wheel. No signal is needed to choose the typeface or typestyle - two parameters that have to be specified when handling a system such as the Sanders machine.

Proportionally spaced output presents perhaps the only challenge for a daisywheel printer. The system has to refer to a look-up table to determine the number of horizontal increments that have to be advanced before striking the next character.

As typefaces are stored in a

die-matrix printer as a set of fixed height characters in a ROM, an identifying symbol must be embedded in the output file and sent down line from the front-end computer whenever changes are to be made in the character set. Other parameters must be communicated to the printer. Apart from the most basic drafting applications, where line length and typing pitch are immaterial, the output stream must contain sufficient coding to define layout features such as margins, tabs, underscores and emboldening.

Accepting that there are computers that cannot handle meaningful escape character sequences, Sanders developed a readable command language to drive the S700. All the symbols in the instruction set are based on mnemonics, followed by numerical parameters where required. These codes can be output as hard copy to retain an accurate description of the instructions within a particular file.

The manufacturer has also retained its escape sequence language, which appeared on the original Media 127 machine, the forerunner of the S700. Commands in the file are indicated by an escape and an ASCII character - an easier instruction for a computer to generate, but not so logical for the operator to decipher.

Depending on the software available in the computer driving it, a needle matrix can act as an intelligent device or a slave printer. The machine's internal logic is almost a necessity for handling proportional spacing, or when two different point sizes and types of character set are to be run into a single line.

Switching into fill mode on the Sanders S700 will ignore the carriage return and line feed signals within an incoming data file. The system calculates the character fitting and justification (creating a flush right hand margin) for each line in turn. A specific code is required at the end of every paragraph to break the logic and force a carriage return where one is required.

The advantage of leaving the printer to handle word wrapping and justification is that it does not matter how many font changes are made within a paragraph - the inter-character spacing will be optimised by the printer's own rules.

With an output resolution of 960 dot positions an inch horizontally and 288 vertically, the S700 can serve well as a medium quality graphics machine. In no way comparable with the output from a pen plotter, a needle matrix is an acceptable device for business graphics. It has an advantage over other printers in the same price range in that it can handle data, multiple text fonts and graphics without a change of head.

Driving the S700 as a graphics device requires a front end that can generate a raster image of the illustration to be plotted. The signal is batched out six rows at a time, the image being made up from a 64 character graphics set in one of a dozen different resolutions.

The fact that needle matrix printers are about 25% more expensive than a top-quality daisywheel is proving no obstacle to sales. As demand from business systems vendors increases unit costs will fall to the point where these multi-media devices will present a serious challenge to established technologies in the computer printer market.



Caxton demonstrates his press to King Edward IV and his queen.

## Two dates to remember



The importance of software in the computer market place, as the part of a computer package that actually brings the system alive and meets the customer's applications has never been greater - that's why you should make a diary date now not to miss two very important events:

**NOV 15-18 '83**  
**Software Village**  
at  
**COMPEC '83**

1: First is the Software Village at Compec '83 which is greatly expanded on previous years and will be an integral part of the Show in the West Hall section of the Grand Hall, Olympia, London, November 15 - 18 1983.

**JUNE 5-7 '84**  
**software**  
**'84**

2: The second is the recently announced new Software '84 exhibition and conference. A show devoted entirely to the subject of business and professional software at Park Court, London, June 5 - 7 1984.

Both shows are organised by Reed Exhibitions, the country's largest business exhibition organisers, and sponsored by Computer Weekly and Software in association with Systems International, Practical Computing, Micro Business and Computer Talk.

For more information contact the Exhibition Manager Compec '83 or Software '84, Reed Exhibitions, Surrey House, 1 Throby Way, Sutton, Surrey SM1 1QQ. Telephone: 01-645-8040.



Xerox's laser printer - high quality and fast.







# The struggle for sales gets tough as imports from Far East rise

Over 80 per cent of printers sold in the UK now come from abroad, reports John Aczel

It is expected that prices will fall further, particularly for daisywheel printers. The quality of these is being improved, but their prices are coming down rapidly, due to strong competition from many Japanese firms

THE market for computer printers has been growing more rapidly than expected, fuelled partly by the rapid growth in sales of microcomputers. During 1982 demand for printers is estimated to have gone up by 65%, while sales of low-cost ones (under £1,000) may have doubled, though official figures are hard to get.

There is little published data, so it is hard to estimate the market for printers. According to various sources the figure for 1982 was between 170,000 and 200,000, excluding printers for home computers, such as Sinclair's, although the dividing line is not easy to draw.

A good way to estimate the market is to analyse import trends, as statistics for these are available from official sources. Over 80% of the printers sold in the UK probably come from abroad. Printers made in the UK are mostly for specialised purposes.

During the first five months of 1983, over 140,000 printers were imported, which was double the number in the corresponding period in 1982. The statistics do not differentiate between different types of printer, so this figure includes say, daisywheel printers as well as cheap ones used with games and home computers.

If the trend is maintained, imports during 1983 will reach a record figure of between 350,000 and 400,000, compared with 200,000 in 1982.

In terms of value, there has also been a marked increase in imports, though less than the rise in volume, because of severe price-cutting. Thus, from January to May 1983, imports were, at over £70 million, up 50% compared with the same period in 1982.

Japan now leads in printer sales. In the first five months of 1982, its sales to the UK reached a record of over 80,000 - nearly three times the figure for 1981. These imports were worth £18 million and repre-

presented about 55% of the market. Imports from other Far Eastern countries, Hong Kong and Singapore, have also been increasing. Deliveries from Hong Kong have gone up particularly fast, though the total is still relatively small.

The US has maintained a strong position in the market for printers - the number two in terms of volume, representing about 20% of imports by volume. But this share has shown little change over the past year.

By value, imports from the US were still ahead of those from Japan, because US products cost more. But if Japanese manufacturers keep sales rising at their present rate they will soon overtake

their American competitors in value terms.

Deliveries of printers from Europe have also been increasing but they have been well behind Japan and the US. Sales by the Netherlands rose markedly to over 15,000 - about triple the figure for the previous year.

Sales by West Germany nearly doubled to over 4,000, but deliveries from France and Italy fell significantly.

Competition has been growing even fiercer, which has been reflected by the considerable fall in prices. Some of this fall has been due to technological improvements, but some manufacturers have been reducing their margins

significantly to maintain their sales at satisfactory levels.

During the first five months of 1983 the average price of an imported printer was about £500, compared with nearly £650 a year earlier. (This is not the price paid by the user, as it does not include wholesale and retail margins; nevertheless, the drop in prices has been substantial.)

It is expected that prices will fall further, particularly for daisywheel printers. The quality of these is being improved but their prices are coming down rapidly, due to strong competition from many Japanese firms.

Britain has been increasing its exports of printers, though the figures include re-exports. During the first five months of 1983, 45,000 printers were exported, compared with only 13,000 in the same period in 1982.

Many of these exports were small printers, particularly printers used with Sinclair machines. The average price was low, but they boosted the volume figures.

The value of printer exports during the first five months of 1983 was £21 million - up 55% on the same period of 1982. Useful gains have been made in some Western European countries, particularly in West Germany.

Deliveries to Germany rose by over 70% to £3.3 million, while those to Italy reached a record figure of nearly £3 million. Exports to the Benelux countries and to Spain were also up.

Sales of British printers to the US have been helped by the weakness of sterling against the dollar. Deliveries to the US were £2.2 million in the first five months of 1983, representing 10% of British printer exports. British exporters are expected to increase their penetration into this key market during the next 12 months.

Export prices have been under pressure and dropped to an average of around £470 in the early part of 1983. Compared with a year earlier this was a fall of about 50%. But the composition of exports has changed considerably, as the number of small micros has rapidly increased. This has reduced the average price of printers sold abroad, but British exporters have also had to trim their margins because of strong competition.

The UK had a trade deficit of

Table 1. BRITISH IMPORTS OF PRINTERS (BY VALUE)

	Jan-May-Jan-May	1983	1982
Austria	2800	2800	
Belgium	320	353	
Canada	443	256	
Denmark	237	118	
France	89	153	
Germany (West)	2,307	5,058	
Hong Kong	2,107	2,445	
Ireland	3,696	3,351	
Italy	2,374	5,410	
Japan	18,303	5,501	
Netherlands	11,256	2,770	
Spain	216	25	
South Africa	71	1	
Sweden	3,473	3,717	
Switzerland	189	136	
US	23,786	14,598	

Table 3. BRITISH EXPORTS OF PRINTERS (BY VALUE)

	Jan-May-Jan-May	1983	1982
Austria	8000	8000	
Belgium	199	261	
Denmark	630	200	
France	4,407	2,816	
Germany (West)	3,335	1,855	
Greece	51	91	
Ireland	426	228	
Italy	2,873	1,965	
Netherlands	1,644	229	
Norway	335	180	
Saudi Arabia	1,007	365	
Spain	1,574	1,302	
South Africa	437	476	
Sweden	765	480	
Switzerland	444	254	
US	2,236	613	

Table 2. BRITISH IMPORTS OF PRINTERS (BY VOLUME)

	Jan-May-Jan-May	1983	1982
Austria	577	351	
Belgium	238	156	
Canada	194	178	
Denmark	182	96	
France	3,224	2,185	
Germany (West)	4,282	2,185	
Hong Kong	3,119	161	
Ireland	989	2,292	
Italy	2,592	4,238	
Japan	80,166	30,431	
Netherlands	15,653	4,124	
Spain	1,626	1,601	
South Africa	206	3	
Sweden	1,991	1,136	
Switzerland	630	200	
US	26,724	14,517	

Table 4. BRITISH EXPORTS OF PRINTERS (BY VOLUME)

	Jan-May-Jan-May	1983	1982
Austria	405	150	
Belgium	1,225	148	
Denmark	1,145	315	
France	17,908	2,319	
Germany (West)	7,748	3,919	
Greece	45	99	
Ireland	549	294	
Italy	4,336	1,201	
Netherlands	2,147	187	
Norway	707	122	
Saudi Arabia	1,444	45	
Spain	332	836	
South Africa	1,989	642	
Sweden	1,202	344	
Switzerland	1,169	248	
US	1,881	643	

## Printer care boosts quality

by David Aldridge

THE printer has changed little during the computer evolution. It is a basic workhorse and its familiar output is frequently taken for granted. But a range of accessories can dramatically increase productivity.

Loose and untidy cables are often found in the computer room, which are a danger to operators and other personnel. If there is an accident, hardware can be damaged too. If the interface connections are broken, cables should always be labelled for easy identification, and should be neat and tidy in the special ducts now available for them, or secured with nylon ties and passed over horizontal surfaces and walkways in cable bridges.

All too often the microcomputer

or microcomputer printer is on a desk top. Through its constant noise, the printer will vibrate and in time the desk may break. Special printer tables are available to withstand the weight and cope with stress and vibration. Many provide for the printer to be permanently fixed.

Efficiency in handling and distributing line printer output can be much improved by using paper baskets, or paper taxis. These hold individual boxes of paper, which can easily be moved and distributed. When a change in line printer output is required, the operator can promptly change the paper to ensure rapid turnaround.

The dust from paper accumulates within the printer and should be removed regularly with a special cleaning kit. Dust can also

cause the ribbon to become dry and clogged, which will result in lower quality images, and more frequent requests for ribbon changes. It will also contaminate and clog type elements, which again affect print quality. Daisywheels can now be cleaned easily with one of the special cleaning kits, without damaging the characters.

The noise from a printer may trouble other workers. It is easily reduced by placing the printer in a sound cover. The best covers reduce printer noise by at least 90%.

When the printer is not in use, it should be switched off and protected with a dust cover, profiled to its shape.

David Aldridge is Product Marketing Manager of Innmac (UK).

## PRINTERS

THE daisywheel printer has been one of the most important advances in computer technology over the last 10 years - at least for the business user. For, without the daisywheel, there would be no such thing as word processing. The daisywheel has brought mass computing power to the smallest and most humble of offices.

The clear, easy-to-read, speedy output has made life easier for the executive and his or her secretary. Especially



In the beginning was Henry Hill. In 1714, Hill, an engineer, filed the first patent for a writing machine - the primeval typewriter - at the British Patents Office. Over 150 years later, Samuel W. Shole and Carlos Glidde, two Americans, began to market a machine which was the true father of the daisywheel printer.

The Shole/Glidde machine had all the characteristics of the modern typewriter: upper and lower case keys, inked type bars, rubbered covered roller, radial ribbon and, most important, the moving carriage controlled by a coiled spring, strap and ratchet escapement.

E. Remington & Sons, of New York, sold 400 of these machines in 1874. But nothing more was to happen to typewriter technology until the invention and commercial adaptation of the electric motor, which speeded up the typing and removed most of the physical effort.

This was followed by the invention of the moving-front carrier, which did away with the cumbersome moving carriage. Working on the same principle as today's golf ball typewriter, the moving-front carrier gave greater speed and accuracy.

Meanwhile significant developments were occurring in commercial computers.

The first massive commercial number-crunchers emerged in the data processing days capable of outputting vast quantities of data, usually in the form of numbers or program listings.

During the data processing

for the secretary, who no longer has to type boring, repetitive reports, or scrap a morning's work because of mistakes in typing or because the boss has changed his or her mind.

Daisywheel printers were invented in the early 1970s and have since become such an important part of business life that much of what happens in a business is evaluated by the quality of its computer generated documents.

Often, all that customers see of a company is the paper before them. The image of the company is in the hands, or petals, of the daisywheel.

Developed originally for the dedicated word processor user, the daisywheel is now finding its way as an all-purpose high-quality printer into all but the largest installations. Even in these, there may be one or two for the occasional one-off document.

# Daisy Daisy gives her answer to the office user's printing needs

For everything but the very top end of the market, daisywheels provide the quality on which businesses are judged, writes Mike Sawyer

signing equipment to position accurately the head of a disc drive over the magnetised disc.

He discarded the previous idea of using pneumatic or hydraulic technology to position the disc and used instead a linear motor to improve accuracy. He also thought a linear motor might be a good way of powering a disc printer similar to the Singer one.

Diablo liked Lee's idea and agreed to fund development of a project which eventually resulted in the production of the first daisywheel printer. Called the High-type 1, series 1200, the machine was capable of 30 cps. It had a High-type 12-bit interface, cloth or film ribbon and an external power supply.

Lee left Diablo shortly after the company was taken over by Rank Xerox, and Lon Israel left Singer to join Lee in setting up their own company in 1973.

Lee is now president of Qume, one of the most successful daisywheel printer manufacturers, alongside Diablo.

Managing director of Qume UK, Colin Lillywhite, assessed the

daisywheels performance in the market. "The major sector of our market," he said, "is the classic word processing application, where companies are looking for high quality letter print-out."

The daisywheel has introduced many business users into computing for the first time. With prices for dedicated word processors at around £3,000, an important change in the market came with microcomputers. A micro interfaced with a printer will in many cases cost less than a word processor and offers all the added advantages of a micro.

This is the market where Qume made its first killing. But, as Lillywhite is finding, things are changing. The daisywheel grew up in competition with dedicated word processors. Most of the buyers were businessmen who interfaced the daisy with a micro of their existing computer system and used it as part of a WP system.

However, matrix printers, which use needles to produce a character, typically out of nine dots are fast approaching the letter quality of the daisywheel, while the matrix's high speed and lower price make it an attractive alternative. As a result, computer maker Fujitsu predicts a dramatic fall in the demand for daisywheels.

But Lillywhite is confident about the future for Qume. He said: "With the spread of stand-alone systems, the constraint of printer speed no longer applies. In a single stand-alone system handling what is a relatively small amount of output, users are finding the combination of speed and quality provided by the daisywheel well suited to their needs."

Lillywhite is talking about machines offering speeds of up to 70 or even 80 cps, two years or more before repair and a life of six to seven years.

Then dedicated word processors capable of producing high quality one-off documents emerged into the business marketplace and the principle was established in business circles that it was possible to get high-quality print from a computer.

Manufacturers were under pressure to come up with something more reliable than the electric and cheaper than a dedicated word processor.

In the late 1960s Singer Business Machines introduced the idea of using a rotating disc to print from. The disc had a number of spokes, with a type character on the end of each spoke.

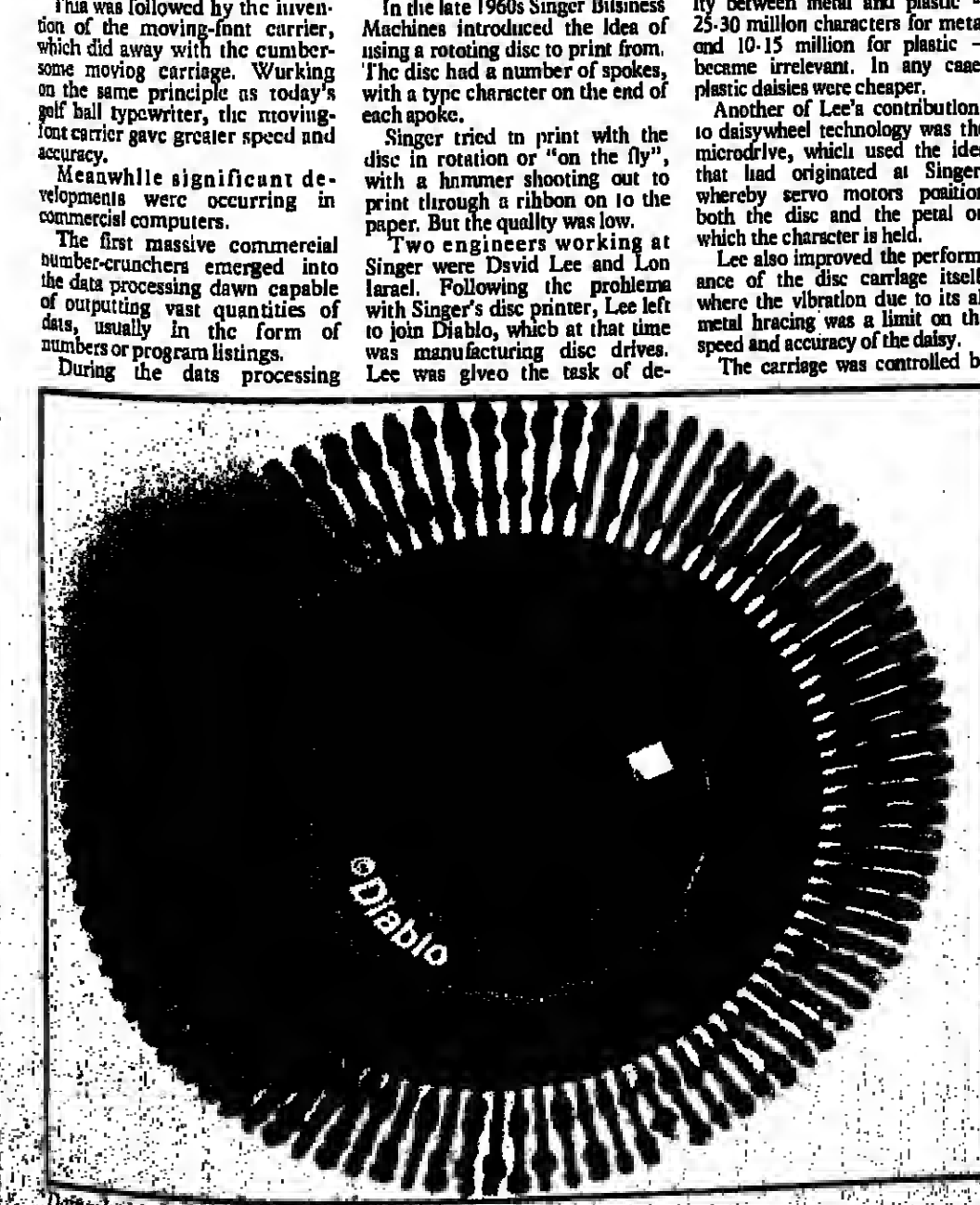
Singer tried to print with the disc in rotation or "on the fly" with a hammer shooting out to print through a ribbon on to the paper. But the quality was low.

Two engineers working at Singer were David Lee and Lon Israel. Following the problems with Singer's disc printer, Lee left to join Diablo, which at that time was manufacturing disc drives. Lee was given the task of de-

The major feature of the High-type was its plastic daisywheel. Lee had replaced the metal daisy with a plastic one to make the machine lighter and faster. Because the wheel could easily be changed the difference in durability between metal and plastic - 25-30 million characters for metal and 10-15 million for plastic - became irrelevant. In any case, plastic daisies were cheaper.

Another of Lee's contributions to daisywheel technology was the microdrive, which used the idea that had originated at Singer, whereby servo motors position both the disc and the petal on which the character is held.

Lee also improved the performance of the disc carriage itself, where the vibration due to its all metal housing was a limit on the speed and accuracy of the daisy. The carriage was controlled by



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UNIX is a trade mark of Bell Laboratories. Trans House, Trans Street, London SW1P 1DE. Tel. 01-828 6661

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## PRODUCTS

## Transfer of data at two megabytes a second

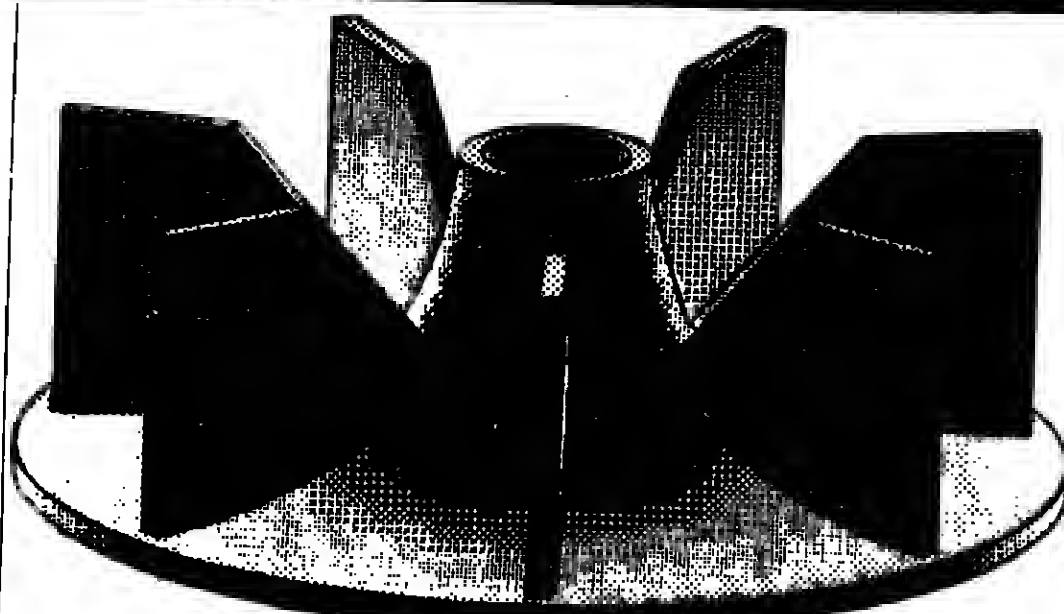
XYLOGICS International describes its new Model 472 as "a high throughput tape controller for streaming and start/stop half inch tape drives which offers optimised operating efficiency and performance for IEEE-796 Multibus systems."

The Model 472 resides on one single height Multibus printed circuit board. The controller addresses up to 16 Megabytes of memory and controls up to eight tape drives running at speeds from 12.5 ips to 125 ips at densities of 800 bpi NRZI, 1600 bpi PE, 3200 bpi PE or 6250 bpi GCR. The tape controller transfers data at two megabytes a second.

The Model 472 peripheral controller uses channel control techniques for optimised performance in the multiprocessing environment of the IEEE 796 bus and 16/32 bit microprocessors such as the 8086, 68000, 16032 and Z8000. Commands are issued from an operating system by creating an I/O Parameter Block IOPB.

Multiple IOPBs may be linked together for optimal peripheral processor throughput.

XYlogics International (CW), 46-48 High St., Slough, Berks, SL1 1EN. Tel: (0753) 78921.



The Calma mass properties calculation system.

## CAD/CAM software package for mass properties calculation

CALMA has introduced a program for automatic calculation of mass properties into its DDM/Solids software package for mechanical computer-aided design and manufacture.

The mass properties calculation system is an integral part of a package which is being developed to provide a comprehensive solid modelling design tool, and allows any complete surfaced design or enclosed volume to be analysed for its mass properties.

Values that can be calculated with the Calma system include surface area, volume, mass, centroid, mass moment with respect to model-space or centroid axes, and mass product with respect to model-space or centroid planes and optionally about a user-definable axis.

The software package is designed for ease of use by mechanical engineers, and works with any design that is completely enclosed by surfaces oriented to the solid side of the design.

As an option, the user can also specify a quality factor to indicate the degree of precision required in the answer.

Calma UK (CW), Beech House, London Road, Camberley, Surrey, GU15 3HR. Tel: (0276) 682021.

## Low-cost printer first of new range

GEVEKE Electronics, has introduced a range of products under the name Getex. Among the first is a low-cost daisywheel printer, at a suggested retail price of £475.

The Getex D-14 offers 3 Kbytes of buffer memory, red/black printing, and a graphics facility. It also has immediately available paper handling options of a forms tractor and cut sheet feeder.

With its cassette wheel containing 96 characters, the Getex D-14 offers high quality print in both normal text and shadow tones, says Geveke.

The Getex philosophy is to provide dealers with a wide range of printers to suit everyday requirements.

Geveke UK manager Tony Bewarick said: "The idea of Getex is to help suppliers and our customers alike. As a major European distributor of peripheral products

we see our job as being able to provide dealers with reliable products, from quality manufacturers at attractive dealer prices, and ensuring good market penetration for our suppliers."

"What we are now doing is to provide a name and a range of products, which will inspire confidence because they have the personal backing of Geveke rather than just the manufacturer."

"The first significant product with the Getex name is a low cost, versatile daisy-wheel printer which we recommend to our dealer base knowing that it is of top quality at the most favourable price."

Other Getex printers are currently being selected and will shortly be available to dealers.

Geveke Electronics (CW) RMC House, Vale Farm Road, Woking, Surrey, GU21 1DW. Tel: (04862) 26331.



The new daisywheel printer from Geveke Electronics.

## Data retained during power blackouts

AN industrial microprocessor-based controller/data concentrator, able to accept up to 32 inputs from data collection terminals and retain data even through power blackouts, is available from Astron Warwick Electronics.

The controller, Series 53, is designed to communicate with and to control Astron Warwick's System 52 intelligent data collection terminals in applications including staff attendance recording, flexible working hour systems and security systems as well as shop floor data collection.

The controller is contained in a dirt and weather-proof box. Astron Warwick Electronics (CW), Perry Road, Stable Tye, Harlow, Essex CM18 7NE. Tel: (0279) 39987.

nals in applications including staff attendance recording, flexible working hour systems and security systems as well as shop floor data collection.

The controller is contained in a dirt and weather-proof box.

Astron Warwick Electronics (CW), Perry Road, Stable Tye, Harlow, Essex CM18 7NE. Tel: (0279) 39987.

## Dynamic support of Lotus cache memory

POINT 4 Data Corporation has added dynamic management of its Lotus cache memory under Release 7.5 of the Iris operating system.

The Lotus cache memory is a solid state device which acts as a buffer between the CPU and disk device.

With a capacity of up to one megabyte per board, the Lotus

cache memory stores large amounts of frequently used data blocks. Access to these data occurs at electronic speeds via DMA transfer, eliminating seek and latency times.

Items which are known to have a high frequency of usage, such as certain program segments or data file indexes, may be statically allocated for storage in the cache by the user. Now, with this enhancement to Iris, all other disc data not statically reserved may be dynamically allocated to the remaining Lotus cache memory automatically.

"Basically," said Larry Baboid, product marketing manager, "the system will now be able to determine the best use of the Lotus cache memory. It will use the Lotus

as a true cache, taking full advantage of all available memory for a more cost effective higher throughput system. And it is a labour-saving device for the user. When he does not know his most frequently used files, he can now let the system do it."

Point 4 Data Corp (CW), 2549 McCabe Way, Irvine, California 92714. Tel: (714) 863 111.

## New features for 600chps printer

DATA TYPE has introduced a new version of the successful Florida Data OSP 130 matrix printer.

The OSP 130 version features single sheet feed, tractor paper feed, cut sheet feed, graphics capability with dot addressable graphics and a facility which permits down line load of the user's own or specific character sets, for the standard price of £2,950.

The printer also now has serial and parallel interfaces as standard and Diablo 1630 or 1650 printer software compatibility.

These features would have previously added nearly £1,000 to the price, says Data Type.

Using proprietary printhead technology the Florida Data OSP 130 offers a 600chps print rate for draft or DP output and between 100 and 150 chps print rate for letter quality output.

Data Type (CW), Llantarnam House, Llantarnam Industrial Park, Cwmbran, Gwent, Wales NP23 5TA. Tel: (0633) 71177.



## 256 kilobyte memory card for Zenith

ZENITH Data Systems has introduced a 256 Kbyte dynamic RAM card, the Z205, for use with its Z100 series of desk-top microcomputers and other S-100 computers.

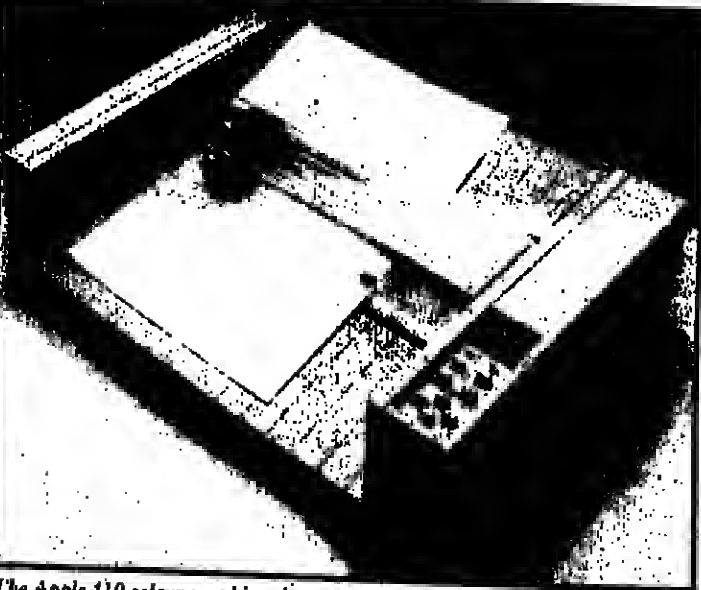
The memory card is a low-cost means of increasing the power of Zenith's Z100 system by providing greater capacity for larger programs.

The Z100 series provides 128 Kbyte RAM as standard and can be expanded to a total of 768 Kbyte user RAM. By adding the Z205 memory cards to the standard system, comprehensive business programs can be handled, such as accounting and stock control, without segmenting the programs.

Z205 cards can be included in a Z100 system at the time of purchase or added to the system later. The cards can be plugged into the S-100 board within the computer on the user's premises.

Customers of Convergent Technologies, workstations and 32-bit machines, including big names such as NCR, Burroughs and Prime, are also expected to take the product in large numbers.

International sales director Bob Groves said UK retailers were "very excited" by Worklate. It would be launched in the UK once the communications had been worked out with the publishers.



The Apple 410 colour graphics plotter.

## Apple launches its first colour graphics plotter

APPLE Computer has introduced its first colour graphics plotter. The machine is a four-pen, flat bed plotting device, capable of supporting paper and transparency materials up to A3 in size. The Apple Plotter will be compatible with both Apple IIe and Apple III computer systems and will be available in September for about £700.

"With more and more engineering/design software becoming available, Apple saw the importance of producing a plotter that would help end users more effectively," said Stephen Holmes, Apple IIe product manager in the UK.

The Apple 410 Plotter marks a new direction in graphics aids. Rather than relying on a computer's intelligence, this machine has its own ROM. It needs only a single command from the programmer before it is able to draw complex shapes.

The plotter will come with a wide range of accessories including four types of pen in eight colours, transparencies for overhead projection and a choice of either A4 or A3 plotter paper.

The Apple Plotter operates with up to four pens at once.

Apple Computer (UK) (CW), Eastman Way, Hemel Hempstead, Tel: (0442) 60244.

including Computerland. Customers of Convergent Technologies, workstations and 32-bit machines, including big names such as NCR, Burroughs and Prime, are also expected to take the product in large numbers.

International sales director Bob Groves said UK retailers were "very excited" by Worklate. It would be launched in the UK once the communications had been worked out with the publishers.

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IBM 3330/3380 MVB COBOL IMS DB/DC ADF PROGRAMMERS & ANALYST PROGRAMMERS  
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Database Support Middlesex

ICL/ME29 to £16K  
Commercial Design Herts

IBM SYSTEM 34/38 MAAPICS to £13K  
Surrey

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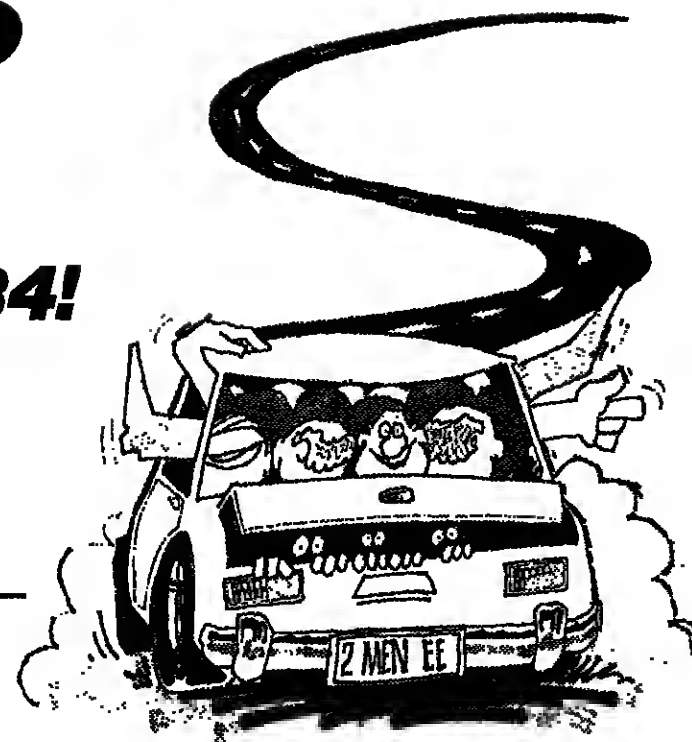
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GEC Babbage and Vlawdata Progs.  
GEC 4000 and/or CORAL all levels  
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Honeywell GCOS, IOS, TOS, COBOL  
Honeywell L6 GCOS, TPS Tech Support or Systems Progs.  
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DL 102  
SB 150  
SC 104  
SC 166  
SC 167  
SC 109  
DB 110  
DB 162

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CW 114

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IBM PL1, Adabas  
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IBM COBOL IMS DB/DC  
IBM COBOL CICS DL1, some with JSP  
IBM NOMAD  
IBM System 36 RPG III  
IBM System 3 RPG II with CCP  
IBM MANTIS Progs  
ICL IDMS Analyst with Inventory Control  
ICL IDMS Database Analyst  
ICL DRS 20 and CICS COBOL Progs.  
ICL IDMS Systems Prog./Designer  
ICL ME29 TME range COBOL  
ICL System 26 Designer and Progs.  
ICL VMEB IDMS, all levels, some with TPMS  
ICL VMEB COBOL with SCL  
INTEL 68086 Programmers with PLM  
INTEL PASCAL Progs. with Talacoms

DL 156  
SB 115  
DB 116  
DL 116  
PH 159  
DB/DL 120  
PH 121  
SB 122  
SC 127  
SC 165  
PH 159  
PH 163  
CW 164  
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DB 139  
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DB 145  
KC 169  
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IBM COBOL, CICS, DL1, COPICS An/Progs  
IBM COBOL, CICS, Adabas Progs  
IBM 6100, DPPX An/Progs  
IBM MVS Systems Programmer  
IBM System 36 RPG III An/Progs  
ICL VMEB COBOL Programmers  
ICL VMEB, IDMS, COBOL An/Progs  
ICL VMEB COBOL, IDMS, TPMS An/Progs  
ICL ME29 Range COBOL An/Progs  
HP3000 Image, View, Query An/Progs  
PDP RSX RTL2 Programmers  
UNIVAC 1100 DMS TIP An/Progs  
Manufacturing Analyst pref. with PDP/IBM  
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IBM Network Controllers  
ICL VMEB Operators  
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Mini-Micro Sales Executives, target earnings £25k Ref: F82  
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Surrey to £13k + excellent benefits Ref: J151  
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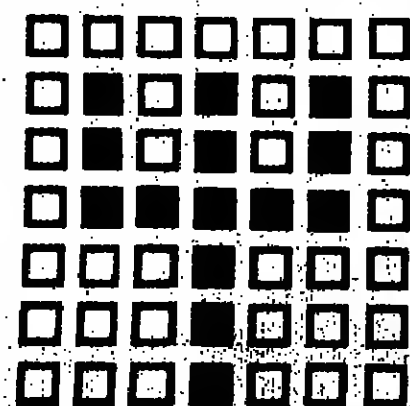
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£11,000

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Enough said.

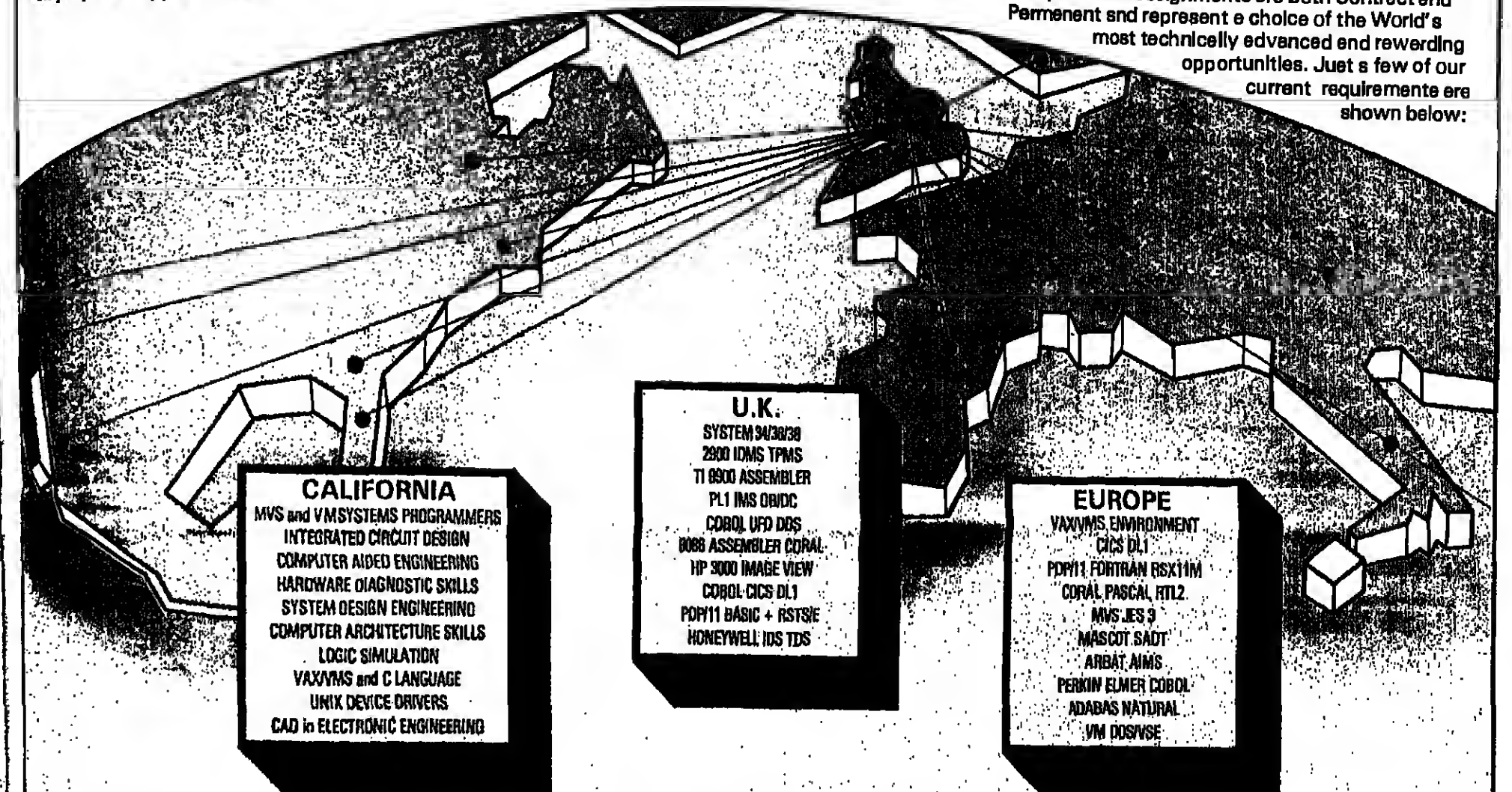
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The Directory has now been operating successfully for almost one year. We have introduced many people DIRECTLY to computer users and both sides have benefited substantially. The Contractor has achieved higher pay because of no third party being involved. We can also inform you of many more employment opportunities.

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The National Computer Contract Directory has a growing number of international subscribers and we have been asked to resource development projects in many parts of the world including The United States, Caribbean, Middle East, Far East and Europe. These assignments are both Contract and Permanent and represent a choice of the World's most technically advanced and rewarding opportunities. Just a few of our current requirements are shown below:



**CALIFORNIA**  
MVS and VM SYSTEMS PROGRAMMERS  
INTEGRATED CIRCUIT DESIGN  
COMPUTER AIDED ENGINEERING  
HARDWARE DIAGNOSTIC SKILLS  
SYSTEM DESIGN ENGINEERING  
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LOGIC SIMULATION  
VAX/VMS and C LANGUAGE  
UNIX DEVICE DRIVERS  
CAD in ELECTRONIC ENGINEERING

**U.K.**  
SYSTEMS ANALYSTS  
2800 IOWA TPMS  
TI 9800 ASSEMBLER  
PL1 IMS DB/DC  
COROL LFD DRS  
R088 ASSEMBLER CORAL  
HP 3000 IMAGE VIEW  
COROL CICS DL1  
PDY11 BASIC + RST3E  
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CORAL PASCAL RTL2  
MVS JES 3  
MASCOT SADI  
ARBAT AIMS  
PERKIN ELMER COROL  
ADABAS NATURAL  
VM DOS/VSE

### DIRECTORY ENTRY DETAILS

NAME		CATEGORY		NO OF YRS		CATEGORY PREFERRED	
ADDRESS		PROGRAMMER					
TEL NO.		ANALYST					
NO OF YEARS EXPERIENCE		ANALYST PROGRAMMER					
PREFERRED WORK LOCATIONS		SYSTEMS PROGRAMMER					
DO YOU CONSIDER WORKING ABROAD?		CONSULTANT/PROJECT MANAGER					
ARE YOU ABLE TO START YOUR NEXT CONTRACT?		OTHER - SPECIFY					
HONORARY EXPERIENCE		SYSTEMS SOFTWARE		APPLICATIONS		ENVIRONMENT	
PROGRAMMING LANGUAGES		I.E. COBOL, BASIC, FORTRAN, PASCAL, PL1, PL/I, RPL, SNOBOL, SIMULA, SMALLTALK, TUTOR, VIM, VMS, etc.		I.E. FACTORY, ORDER ENTRY, etc.		I.E. MANUFACTURING, etc.	
APPLICATIONS SOFTWARE							

THESE ARE JUST SOME OF THE SKILLS OUR SUBSCRIBERS ARE SEEKING

Remember, if you have three years' + programming or analysis experience - mainframe, mini or micro - you should exploit your potential fully by completing and returning this entry form.

The directory is financed completely by its subscribers and no charge is made to you for our services.

PLEASE RETURN TO: WILLOWAY LTD (THE NATIONAL COMPUTER CONTRACT DIRECTORY)  
FREEPOST, RICHMOND, SURREY TW9 1BR







## RECRUITMENT OPPORTUNITIES

### DEC SYSTEMS ANALYST LONDON

Up to £15,000

Our clients, a well-respected service bureau, have a requirement for a systems analyst to join one of their project teams. Ideally, applicants should possess a minimum of three years' experience in analysis and design of commodity accounting systems plus a programming background using Basic, although Stockmarket or other financial applications experience will be considered. The successful candidate will work closely with other members of the team and will report directly to the Project Leader.

### SYSTEMS PROGRAMMER SURREY

Up to £14,000

This well-known company have an urgent requirement for an I.B.M. Systems Programmer who has extensive experience of the generation and maintenance of M.V.S. operating systems on either 30XX or 43XX series hardware. The benefits associated with this position include flexible working arrangements, staff shop and L.V.A.

### SENIOR ANALYST/PROGRAMMER LONDON

Up to £11,000

An experienced Analyst/Programmer is sought by this company to work on the development of a new ledger software package. Applicants must have a minimum of four years' programming in Fortran and have previously worked on a variety of ledger applications. This is a newly created position and would ideally suit someone in their late 20s-early 30s. Benefits include a 32.5-hour working week.

### PROGRAMMER LONDON

Up to £9,000

A major British company have a requirement for a young programmer to join their development team based in London. This represents an ideal opportunity for candidates of 'A' level or degree standard, and two years' programming experience in BASIC+2 using RMS on DEC equipment, who wish to develop their potential in a demanding environment.

## CONTRACTS:

MUMPS Designer, Project Leader

DMS II Programmers

TSO/SPF CICS Analyst Programmer

RPG III Sys 38 Programmers

VAX BASIC +2 Programmers

IDMS Designer, Project Leader

COBOL DL1 DB/DC Programmers

COBOL, TOTAL, VSAM Analyst/Programmers

DOS/VE COBOL, SHADOW Analyst/Programmer

RPG II Sys 34 SDA, MCV, Programmer

U1100 COBOL FMS, Database Analyst/Programmer

WICAT RM COBOL Analyst/Programmers

PL1, DOS, ASSEMBLER Systems Support

PL1, SHADOW Analyst/Programmer

PL1, CICS, IDMS CMS, TSO, Programmer

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### AUTOTYPE INTERNATIONAL LTD.

## Programmer/Analyst

Autotype International Limited, a company in the Norcross Group, is one of the world's leading manufacturers of coated paper and film for the graphic arts industry.

Due to recent expansion and the introduction of a Systime computer, we are seeking to appoint a Programmer/Analyst to assist with the immediate computerisation of areas including invoicing and the order book, with further development planned for the future.

The ideal applicant will have had a minimum of 2 years experience of programming/analyst work in an industrial environment, preferably using a Systime computer. Close liaison with all company departments will be necessary and the ability to assimilate and accurately translate individual requirements is paramount. A flexible approach and willingness to assist with the daily operation of the computer system is also required.

In addition to a competitive salary of circa £9,000 per annum, other company benefits include a profit sharing scheme, contributory pension plan, subsidised canteen and a pleasant working environment.

Please write or telephone for an application form or send career details to: Personnel Department, Autotype International Limited, Grove Road, Wantage, Oxon, OX12 7BZ. Telephone 02357 66251 (24 hours).



### CONTRACT TECHNICAL AUTHORS

First class IBM Software Technical Authors needed for Long Term assignments (min one year) within London and the Home Counties. The first essential qualification is at least one year's experience as a Technical Writer with in-depth knowledge of IBM operating systems, complex software and Assembler. Successful applicants will have an IBM programming background plus the ability to communicate at all levels with both O.P. and Publishing staff. For further details call 01-587 1531

### IBM JCL WRITERS

Immediate start. Five years' experience essential. TSO/SPF, MVS JES, CICS, DATABASE, VLSI, VSAM, VSPC advantageous. Call 01-587 1440


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Research Machines' microcomputer systems have enjoyed remarkable success in the secondary and further education sectors and are well placed to gain a significant share of the rapidly developing primary sector. This market penetration has been achieved through a policy of designing systems specifically for educational applications; providing comprehensive support to educational users; analysing and responding to the needs of these users, and a commitment to product quality, performance and reliability.

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We are now looking for a Senior Sales Executive to take responsibility for and further develop UK education sales. The successful candidate for this important position is likely to have:

- ☐ A degree or equivalent
- ☐ Experience of selling computers or other high technology equipment to education authorities, ideally at a national level

- ☐ Good grasp of the structure, finance and operation of the educational market at all levels from individual establishments to government
- ☐ Broad appreciation of hardware, software and educational applications, preferably based on practical experience of microcomputers in education

We expect that your responsibilities over time will include recruiting and managing field sales personnel to support the development of this area. Research Machines is an established pioneer in a new industry and we offer opportunities for personal and career development in an environment which has high standards of professional and management practice. In addition to an excellent salary we offer a particularly attractive benefits package including part 25 days holiday; free BUPA, life and disability insurance; pension scheme; and generous help with relocation expenses.

If you are interested in this vacancy please contact Polly Keane, on Oxford (0865) 726136 or by letter, for an application form, quoting reference SS2D/CW9.



RESEARCH MACHINES LTD, Mill Street, Oxford OX1 1PW Tel: (0865) 726136

## Business Systems Analyst

c. £11,500

Plessey Optoelectronics and Microwave Limited manufacture a range of Gallium Arsenide based products involving both assembly and process engineering technology. We have recently started to implement a business control system based on a commercially available integrated package and VAX 11/780 accessed remotely, and now seek to recruit a Systems Analyst whose initial responsibility will be to assist in the implementation of the control system. In particular the successful candidate will be expected to analyse the requirements of each key function, i.e., Sales Order Processing, Interface these requirements with the software package and other system users. Other projects currently taking place include electronic mail applications.

Reporting to the EDP Manager, this appointment offers an ideal opportunity for a professional, well motivated person to become involved in the implementation of a total control system. Whilst a good standard of education is expected, applicants should have several years experience of VDU based package implementation on main frame or mini computers. Knowledge of BASIC programming, Telecommunications and DEC computer operations is desirable.

The salary is negotiable around £11.5K, together with BUPA membership and a comprehensive relocation package as appropriate.

Please write or telephone quoting reference CW/P720: Mike Galsworthy, Personnel Resources Manager, Plessey Optoelectronics and Microwave Limited, Wood Burcote Way, Towcester, Northants NN12 7JS. Telephone: (0327) 51871.



## SYSTEMS ANALYSIS

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The opportunity will interest either

- ☐ SYSTEMS ANALYSTS with upwards of two years' analysis experience (the application background is not critical, as our clients will provide training where necessary), or
- ☐ ANALYST/PROGRAMMERS who wish to move to systems analysis work.

If you feel that a move to a major, up-market installation would help your career, please ring us in confidence for a talk, quoting ref. 191. If it is more convenient for you to ring outside office hours, your message will be recorded.



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Sphinx is a rapidly growing, dynamic company, marketing professional microcomputer software.

As a direct result of our success to date and in order to help us maintain our exciting programme of expansion, we wish to receive applications from suitably qualified and experienced personnel to fill the undermentioned senior positions.

### UNIX specialist

This position is in the Consulting and Training Department of Sphinx. The Department is staffed by experts who provide highly specialised services in the areas of consultancy and training in the UNIX world.

Applicants should have an in-depth UNIX knowledge as well as a good understanding of the computer industry in general. You must also be articulate and a good communicator.

The position provides opportunity for some overseas travel.

### Software Sales

(reporting to Software Sales Manager).

The job demands that you sell Sphinx software products and services to Dealers and End Users.

Areas of responsibility will be clearly defined but within these you will be expected to show professional selling skills, initiative and enthusiasm.

Proven sales experience and an understanding of the software systems market are essential.

### Pre-sales Software Support

(reporting to Software Sales Manager).

The position requires you to support the sales team in selling software products to Dealers and End Users. It means, therefore, that the successful applicant will occupy an important position as a positive interface between the product technical staff and the commercial sales force.

An understanding of UNIX is essential and DEC experience would be an added advantage.

The structure of the company will allow career development in the direction of sales, consultancy or training.

### Business Software Support

Applicants should have a knowledge of business languages such as COBOL, DIBOL and BASIC.

You will be part of a small team who specify, evaluate, document and support software under the UNIX operating system.

Experience with business applications under a multi-user operating system is essential.

Sphinx offers excellent career development prospects and the remuneration packages, plus car where appropriate, reflect the importance of the positions.

Interested applicants should submit their CV to:

Mrs. H. Smith,  
Sphinx Limited, 49-88 Moorbridge Road,  
Maldenhead, Barks, SL8 8PL.  
Tel: (0888) 78343.





## RPG II/III

IBM SYSTEM 38  
MIDWEST  
To £13,500

Expanding software house based in North West Midlands requires ambitious young and/or experienced programmers to join their development team. System 38 RPG II/III experience preferred, although they are prepared to train and IBM System 38 RPG II/III programming progress. Excellent salary. REF. C 2697

ANALYST/PROGRAMMER  
To £11,000

Established manufacturing company, London based, requires an analyst/programmer with a minimum of 2 years' RPG II/III on IBM System 38. The successful applicant will be assisting in the development of a range of commercial systems including ledger, payroll, control and costing, should have strong team skills and the ability to work within a small team. REF. C 2651

SYSTEM 38/BANKING  
£8-12,000

International City Bank, currently expanding its D.P. Department, has requirements at all levels for IBM System 38 RPG II/III professionals. Any experience of banking or general finance would be advantageous, and successful applicants will be well rewarded in terms of salary and a full benefits package including subsidised mortgage, share options, and many other contributory pension schemes. REF. C 2697

RPG II/RETRAIN TO RPG III  
£8-9,000 Neg

Due to expansion in their Computer Department, this leading commercial company based in N.W. London require an additional programmer. The successful candidate should have a minimum of 12 months' experience either on the IBM System 38 or System 34 with either RPG II or RPG III. You will be working on development projects, including on-line and database facilities. REF. G 2695

IBM SYSTEM 38 CITY  
£8-11,000

Highly successful financial brokers, are seeking to recruit 2 experienced IBM System 38 professionals. The successful candidates for an analyst/programmer will have a good technical background, gained within a D.E.C. environment, with the ability to take projects through to implementation. The programmer should have 12 months' RPG II experience, and the analyst should have 12 months' RPG II/III experience. Both positions candidates must have a good educational background with at least 1 year's experience in RPG II/III. You will be well rewarded in terms of salary and benefits. Please call for more information. REF. G 2694

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IBM  
OPPORTUNITIESIBM COBOL, DL/I  
(INTERNATIONAL)  
TRAVEL  
HANTS  
To £11,000

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PROGRAMMER/ANALYST  
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New IBM 38, DOS/VSE, and DL/I. The successful candidate will have a good technical background, gained within a D.E.C. environment, with the ability to take projects through to implementation. The programmer should have 12 months' RPG II experience, and the analyst should have 12 months' RPG II/III experience. Both positions candidates must have a good educational background with at least 1 year's experience in RPG II/III. You will be well rewarded in terms of salary and benefits. Please call for more information. REF. G 2694

Brushfield House, 12 Brushfield Street  
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Telephone: 01-247 3356 (24 Hours)

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CITY  
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Can you offer 18 months' IBM COBOL experience? My client, a leading international bank and insurance company, has a vacancy in its IBM COBOL team. The successful candidate will be assisting in the development of a range of commercial systems including ledger, payroll, control and costing, should have strong team skills and the ability to work within a small team. REF. C 2651

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There is an opportunity to join a world famous organisation. My client requires additional D.P. professionals to work on a small support team and get involved with infrastructure systems. The work is interesting and offers very good career prospects. If you can offer an IBM COBOL background under either DOS/VSE, OS VSI or VM CMS, why not give me a call to discuss this exciting opportunity. REF. G 2695

PL/I PROGRAMMERS  
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There is an opportunity to join a world famous organisation to join IBM PL/I programmers with a minimum of 18 months' experience. The company house IBM mainframes under MVS and OS VSI. Experience of either CICS or IMS and real time systems would be desirable as well as experience of working in a team environment. A generous salary and benefits package with normal large company benefits. REF. G 2690

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HERTS  
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Large multi-national organisation who are market leaders in their field are currently in the process of developing new systems. They are looking for an IBM Analyst/Programmer who has experience with PL/I and on-line systems either gained with CICS, DL/I, or IMS, although training matters. The position is offering career progression, excellent development prospects and a pleasant and flexible working environment. REF. G 2690

## OTHERS

HEWLETT PACKARD  
COBOL  
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This major international manufacturing organisation has recently installed a new set of HP 9000 machines. They are currently seeking an Analyst/Programmer with a minimum of 18 months' D.P. experience and at least 6 months' HP 9000 COBOL experience. Based in Basingstoke, the successful candidate will be working on a range of commercial systems including ledger, payroll, control and costing, should have strong team skills and the ability to work within a small team. REF. G 2651

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This major international manufacturing organisation has recently installed a new set of HP 9000 machines. They are currently seeking an Analyst/Programmer with a minimum of 18 months' D.P. experience and at least 6 months' HP 9000 COBOL experience. Based in Basingstoke, the successful candidate will be working on a range of commercial systems including ledger, payroll, control and costing, should have strong team skills and the ability to work within a small team. REF. G 2651

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Salary range: £10,000-£12,000 per annum (plus pension) depending on qualifications and experience.

For further information, please contact the Director of the Department of Computing Science, University of Cambridge, 477, The Old Schools, Cambridge CB2 3RQ.

Applications should be sent to the Director of the Department of Computing Science, University of Cambridge, 477, The Old Schools, Cambridge CB2 3RQ.

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(021)

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The Internatinnal Fast Track - Our client is offering an exceptional opportunity for a young, ambitious programmer/analyst to play a responsible and challenging liaison role in their UK and European commercial network.

The Requirements - The need is for a D.P. professional, probably in the 20's to 30's age range, with a proven ability to successfully deal with people at all levels, whilst providing the technical skills required to adapt the system to individual needs.

The Opportunity - Reporting to the office of the European Finance Director, the individual will assist in the implementation of a financial information system throughout Europe, and will work closely with local and US systems groups.

This is an ideal opportunity for a self-motivated and bright individual, in an environment where he or she will be encouraged to participate in the future development of M.I.S. and to use his or her initiative and talent to their full potential.

The assignment starts in Chicago with a three to four week training programme. Thereafter, the individual will be based in the Berkshire/Hampshire area with frequent travel to Northern and Western Europe.

The Company - Our client is the European Finance Division of a well-known, highly successful multinational electronics and communications group, with a £20 million turnover in the UK alone.

Applicants should have an IBM, COBOL, DL/I background, with approximately two years' MVS, and experience of commercial systems, including general ledgers. The installation includes satellite links to IBM 3083's and AMDAHL V7's in the US, running under MVS, using DL/I and IMS, with an IBM 4331, DOS/VSE CICS, to be installed shortly in the UK.

The Benefits - The rewards are high with salary up to £11,000 plus annual bonus. A relocation package, health/life insurance, and pension cover are provided, together with a discount on company products, plus a first class working environment.

To find out more about this outstanding opportunity, please telephone Carolyn MacLurg on (01) 247-3356 during office hours or (01) 800-9453 evenings and weekends. All applications will be treated in the strictest confidence.

## ENGLEDOWN

COMPUTER PERSONNEL CONSULTANTS

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Bishopsgate, London E1 6AN Tel: 01-247 3356

COMPUTER PERSONNEL CONSULTANTS



# PUBLIC SECTOR APPOINTMENTS

POLYTECHNIC OF THE SOUTH BANK  
Borough Road, London SE1 0AA

## COMPUTER SERVICES DEPARTMENT

Three posts have been newly created in the Computer Services Department to enhance the Computer Users' Support Service provided for academic staff and students.

### USER SUPPORT MANAGER (Ref. CS10)

Salary up to £13,363 per annum inclusive of London Allowance (currently under review).  
The User Support Manager will be responsible for a team of computing specialists providing a software advisory and development service offered at three separate locations. The person appointed will be a graduate, with at least five years' computing experience, including programming, and with experience of supervising computer personnel.

### COMPUTING ADVISOR (2 posts) (Ref. CS11)

Salary up to £11,639 per annum inclusive of London Allowance (currently under review).  
The Computing Advisors will be responsible to the User Support Manager for the service of particular locations. The persons appointed will be graduates, with at least four years' computing experience, including a minimum of two years' programming. Experience of DEC equipment or working in a higher education environment would be an advantage.

### OPERATIONS CONTROLLER (Ref. CS12)

Salary up to £10,266 per annum inclusive of London Allowance (currently under review).  
The Operations Controller will be responsible for the maintenance and development of a high level of hardware and operating efficiency for the Polytechnic computing services. The successful candidate should have at least three years' operations experience on DEC 10/VAX computers and be qualified to 'A' level standards as well as experience of setting and implementing standards for operations.

Application forms and further particulars of these posts are available from the Staffing Office, Tel. 01-928 9989, ext. 2256.

Please remember to quote the relevant job reference.  
Closing date for receipt of completed application forms will be September 22, 1983. (15282)



City of London

## Senior Shift Leader

Salary range £8921-£9817

(Inclusive of London Allowance and 14% shift pay)

Applications are invited for the above post to lead an operating team working a five-day, two-shift rota at the Guildhall. Special responsibilities include design and maintenance of operating procedures, liaising with technical and engineering staff as necessary.

The Corporation runs an ICL 2956 computer with an expanding communications network (including an ME29 configuration) running TP, VME/B and DME3 (George 2) to provide an interactive and batch processing service. Plans to convert and/or replace remaining DME systems will lead to a demanding but rewarding role for those with initiative.

Applicants must have extensive operating experience on ICL computers, most of which should be on S series 2800. A sound knowledge of DME3 (George 2) and VME/B is expected, together with written and verbal communication skills.

The Corporation of London offers generous holiday entitlement, season ticket loan, canteen and bar facilities and a variety of sports and social activities.

Applications in own handwriting giving full CV details, together with the name and address of two referees to:

The Computer Operations Manager  
Chamber of London  
P.O. Box 270  
Guildhall, London EC2P 2EJ

(15261)

UNIVERSITY COLLEGE LONDON AND LH FERMENTATION  
Teaching Company Associate

## SOFTWARE DEVELOPMENT

The Department of Chemical and Biochemical Engineering has gained approval from the Science and Engineering Research Council and the Department of Trade and Industry to establish a Teaching Company program. This is a two-year project in conjunction with LH Fermentation, to design and develop software for the control and analysis of fermentation processes. No knowledge of fermentation is necessary. Approximately 80% of the Associate's time will be spent at LH Fermentation and the post is expected to lead to an accelerated career development with the company. Salary commensurate with experience.

Applications are invited from candidates, aged under 30, with a good honours degree in an appropriate discipline. Applicants should send a full curriculum vitae to: Dr. N. M. Fleh, Department of Chemical and Biochemical Engineering, University College London, Torrington Place, London WC1E 7JE. (15264)

POLYTECHNIC OF THE SOUTH BANK  
Borough Road, London SE1 0AA

## COMPUTER SERVICES DEPARTMENT

### Application Programmer (2 posts)

Salary up to £9,266 per annum inclusive of London Allowance (Ref. CS13)

Vacancies have arisen within the Computer Services Department for two Programmers in the User Support team to install software packages, develop new software, amend existing software and contribute to the programming advisory service offered to students and staff.

The persons appointed will be of graduate level with a minimum of two years' programming experience in at least two languages. Experience of DEC 10 or VAX Systems would be an advantage.

Application forms and further particulars of these posts are available from the Staffing Office, Tel. 01-928 9989, ext. 2256.  
Closing date for receipt of completed application forms will be October 9, 1983. (15281)

## Assistant Scientific Officers LONDON

Two Assistant Scientific Officers are required by the Home Office.

1. To undertake the duties of a computer system operator, for the Scientific Research and Development Branch, in connection with the development of prison security.

The successful applicant should ideally have a flair for operating micro computers and be willing to travel to some prisons and explain techniques to prison staff. He/she may also be involved in data collection.

2. To provide scientific and systems programming, for the Research and Planning Unit, in support of the Unit's Research and Development work. To carry out day to day operation of the Unit's DEC VAX 11/780 computer, involving maintenance of tape and disc libraries.

Salary starts at £4,215 (age 16) - £5,797 (age 21 or over) rising to £7,264 per annum (including Inner London Weighting). Assistant Scientific Officers are encouraged to take advantage of the facilities for obtaining qualifications. Prospects exist for promotion to Scientific Officer and above. Annual leave is 22 working days plus 10½ public and privilege holidays.

The minimum qualifications are four passes in GCE 'O' level (grade A, B or C), or equivalent, including English Language, and a mathematics or science subject, or ONC, or equivalent.

Registered disabled persons will also be considered.

Applicants should apply in writing, to: Mr. P. Haughton, Home Office, Scientific Research and Development Branch, Room 437, Horseferry House, Dean Ryle Street, London SW1P 2AW.

Completed application forms should be returned by: 12.9.83. (15286)

Home Office

## BRIGHTON POLYTECHNIC Department of Computing and Cybernetics INFORMATION TECHNOLOGY INITIATIVE SENIOR LECTURERS/ LECTURERS II IN COMMERCIAL COMPUTING (3 posts)

The department has been selected to increase its student intake to 380 places and now plans an increase in its undergraduate intake.

Do you have the knowledge and experience to assist others to make a good career in Computing?

Applicants must have knowledge and experience of 'real world' computing to teach commercial computing to undergraduates and diploma students.

SALARY:  
Senior Lecturer - £10,883 to £13,443  
Lecturer II - £7,215 to £11,589

Further details and application forms from the Personnel Officer, Brighton Polytechnic, Moulsecomb, Brighton BN2 4AT. Tel. Brighton 023655, Ext. 2537. Closing date: September 23, 1983. (15285)

## UNIVERSITY OF EAST ANGLIA Norwich SENIOR RESEARCH ASSOCIATE COMPUTER GRAPHICS

A Senior Research Associate is required to work with Dr. David Arnold in investigating the feasibility of a process structure graphics system suitable for exploitation on parallel hardware and from parallel algorithms. Such a system should also be configurable to produce different graphics pipelines and different possible distributions across available hardware. The initial vehicle for the study will be the Graphics Kernel System (GKS) - the new ISO standard for 2D graphics, although the implications of proposals for metafiles and 3D graphics standards will also need to be considered. In this context the applicant should be prepared to travel both in the UK and abroad. The appointment will be for one year with a starting date to be arranged. The salary will be at a suitable point on the scale £7,100-£11,615 per annum. It is anticipated that for a suitably qualified and experienced candidate a salary in the region of £8,500 can be offered.

Applications, including a curriculum vitae and names and addresses of two referees, should be sent to: Dr. D. S. Arnold, School of Computing Studies and Accountancy, University of East Anglia, Norwich NR4 7TJ, to arrive by September 23, 1983. (15287)

## PART-TIME LECTURERS IN COMPUTING

To teach data processing, systems analysis and other areas as various courses commencing late September at the Polytechnic of London, including BCS Part 1, BTEC and HNC Computer Studies.

Please write with c.v. and details of availability to: Allan Rodley, Head of School of Mathematics, Middlesex Polytechnic, Queensway, Enfield, Middlesex EN3 4BT. (15284)

## BOX NUMBERS

Box number replies should be addressed to:

Box Number  
c/o Computer Weekly  
Quadrant House, The Quadrant  
Sutton, Surrey SM2 5AS

## DEPARTMENT OF COMPUTING SERVICES

The central Computing Service has three vacancies to support the Polytechnic's use of computers. The major machine is a DEC 2060, although there are several PDP11s also used in the academic field.

### CHIEF APPLICATIONS PROGRAMMER

(£9,945-£12,087)

To lead the Applications Programming group in the implementation and development of software packages to support the academic disciplines of the Polytechnic. Experience in any of the major languages (e.g. FORTRAN, PASCAL, BASIC) and the major packages (e.g. SPSS, PAPEC, NAG, GENESYS, QINO-FI) is useful.

### SYSTEMS PROGRAMMER

(£5,640-£8,712)

To join the Systems group in the support of a variety of operating systems (e.g. RSX11-M) and data communications network. Proficiency in low-level language is desirable.

### PROGRAMMER (ADMINISTRATION)

(£5,640-£8,712)

To join the Administrative Computing group. The group's main task will be the development of on-line systems on a recently ordered IBM S/38 covering all aspects of the Polytechnic administration. COBOL and RPG III experience with a commercial or higher education administration background is desirable.

Further details and form of application available from the Staff Office, Trent Polytechnic, Barrow Street, Nottingham NG1 4BU. Closing date: September 21, 1983. (15288)

TRENT  
POLYTECHNIC  
NOTTINGHAM

## Bolton/Bury Computer Unit

### POST A SENIOR ANALYST/PROGRAMMER (Salary to £10,539 p.a.)

### POST B PROGRAMMER (Salary to £8,712 p.a.)

The Joint Computer Unit of Bolton and Bury Metropolitan Councils invite applications from experienced persons for the above positions. Successful applicants will join one of several teams developing computer projects. We are seeking technically qualified personnel who will have several years' COBOL experience. Ideally for POST A, systems design experience and a demonstrable maturity of approach will be added advantages.

Hardware will be based on ICL 2966 mainframe, using DME GEORGE 3/CME/VM 2900 operating systems and a considerable expansion of distributed computing, via networking facilities, is envisaged.

Application forms are available from the Personnel Officer, Town Hall, Bolton BL1 1RU (Tel. 22511, Ext. 587/6106) and should be returned by September 12th, 1983. Trade Union membership is a condition of service.

An Equal Opportunity Employer. (15289)

## WELSH JOINT EDUCATION COMMITTEE CYD-BWYLLGOR ADDYSG CYMRU

### COMPUTER PROGRAMMER Salary Scale 4/5 £8,264 - £8,712

Applications are invited for the new post of COMPUTER PROGRAMMER in the Computer section of the Welsh Joint Education Committee. The Committee uses an ICL ME29 running an on-line examination system and the person appointed will assist the Computer Officer in both development and maintenance programming work. Applicants should be suitably qualified and should preferably have had 2 years' experience of working in COBOL and of an ICL ME28.

Further details and application forms (to be returned by 21 September, 1983) may be obtained from the Secretary, Welsh Joint Education Committee, 245 Western Avenue, Cardiff CF5 2YX.

J. L. Brace  
Secretary

(15291)

# CTR

Computer  
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## APSE the new database dimension

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SOFTWARE DESIGNER  
PROGRAMMER

For ambitious software experts the project which takes DBMS technology to new and complex horizons is already in its first stages of development within the UK. The kind of people we're really interested in will already be aware of this major step forward in computing, and they'll be eager to apply their expertise. As one of the leading contributors to the introduction of the compiler and its language support environment our client Software Sciences Limited can obviously offer you considerable involvement during the challenging four year + programme. Afterwards, there are many other diverse areas into which you can extend your skills in worldwide projects, ranging from commerce to civil aviation.

Forming the central component of the ADA/APSE project the DBMS provides both an intellectual and practical challenge, stimulating to those software specialists who can match our demands for technical excellence and who are seeking to develop their careers in a dynamic environment.

Your experience will have involved adopting or writing operating systems or DBMS. You'll understand high level languages such as PASCAL, ALGOL 68 or Ada and you'll have a minimum of 3 years general software experience. Depending on the extent of this background, and its bias, you could join them in one of the following areas:

Technical Consultant (£14K-£18K+)

Software Designer (£10.5K-£14K)

Programmer (to £12K).

The company assures your progress and stimulation. To take up the challenge call Richard Nash on 01-734 9723, or 01-581 5829 (evenings and weekends).

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# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

## AREA SALES MANAGER c£18k BASIC SUBSTANTIAL ON TARGET EARNINGS + CAR

The massive resources of one of the world's most respected computer systems manufacturers have been marshalled for a substantial effort to increase market share in the IBM data communications field.

Recent gains in the technical, retail and microcomputer worlds have generated greater impetus to what is regarded by senior management worldwide as one of the key moves in 1983-84.

Not only top training and promotion from within, this endeavour is a well served & essential that they have a clear vision

identify and recruit two Area Sales Managers.

Reporting directly to the divisional director you will be responsible for a team of highly specialist salespeople selling to the Times Top 200 customers. It is therefore essential that you have proven experience of successful management, major to national account sales expertise in sales of IBM or compatible equipment, and above all the drive to make things happen.

The substantial remuneration package includes all normal large company fringe benefits associated with such positions.

Applications are invited from persons living in the London and South East Region.

For an immediate interview contact Tony McGrath on 01-637 9611 or alternatively send your c.v. for consideration to Management and Executive Selection, Suite 201/208 Albany House, 324 Regent Street, London, W1.

MANAGEMENT &  
EXECUTIVE SELECTION

Suite 201/208 Albany House 324 Regent Street London W1R 5AA 01-637 9611

01-637 9611



# Data Processing Manager

c.£13,000

Oxford

Our Client has had a long association with Oxford and has grown considerably over the last century. Now part of a large American Corporation, the Company is one of Oxford's major employers.

The Company manufactures a quality range of specialist products which are highly respected in their field and a recent extension to the product range will ensure that the Company remains ahead of its rivals in a very competitive marketplace.

Central to the Company's operations is an IBM System 34 which is linked via satellite to a dual IBM mainframe configuration at Group Headquarters in the USA. The System 34 may be replaced in due course to provide additional processing capacity.

The ideal applicant for this potentially rewarding position, will be a mature, self-motivated individual, who enjoys the challenge of working in a manufacturing/

engineering environment - someone who has the capability to relate accurately to the needs of Line Managers, the ability to develop a small, young D.P. Department and a desire to become an integral member of a forward thinking management team. Knowledge of COBOL and RPG II is highly desirable.

The position carries an excellent range of benefits which include an attractive starting salary, negotiable in the region of £13,000, a comprehensive relocation package, contributory pension and free life assurance schemes, 25 days annual holiday and free family BUPA cover.

Suitably qualified candidates should forward a detailed CV to Ian Payne, Supervising Consultant at the SCR Birmingham office as soon as possible.

Interviews will be carried out at SCR regional offices during early September.

15701

## Technical, Sales & Management Appointments

Region	Position	Salary	Ref
SOUTH	James House, 46 James Street, London W1M 5HS	01-236 0671/496 0461	
MIDLANDS & INTERNATIONAL	35-37 Great Charles Street, Queensway, Birmingham B3 3JY	021-236 3761	
NORTH	International House, 84 Deansgate, Manchester M3 2ER	061-833 0427	
BELGIUM	Avenue Louise 327, B-1050 Brussels	010 322-648 7181/771	
HOLLAND	Willemsparkweg 92, 1071 H M. Amsterdam	010 3120-780947	

## Specialist Computer Recruitment Ltd

SOUTH  
James House, 46 James Street,  
London W1M 5HS  
01-236 0671/496 0461

MIDLANDS & INTERNATIONAL  
35-37 Great Charles Street,  
Queensway, Birmingham B3 3JY  
021-236 3761

NORTH  
International House, 84 Deansgate,  
Manchester M3 2ER  
061-833 0427

BELGIUM  
Avenue Louise 327,  
B-1050 Brussels  
010 322-648 7181/771

HOLLAND  
Willemsparkweg 92,  
1071 H M. Amsterdam  
010 3120-780947

Motorola is a major multinational company known throughout the electronics and computer industries as a developer and manufacturer of high technology products. Our rapid expansion into the office automation and distributive data processing segment of the industry has created career opportunities, details of which are as follows:

## HARDWARE SUPPORT ENGINEERS

The successful candidate will have a proven track record as hardware support engineers with a minimum of six years' experience with communications, distributive data processing and office automation products. The ability to develop current and future customer credibility is essential. Interest in or previous experience with high level programming languages will enhance prospects and potential for future advancement. HNC, HND are preferred qualifications but not essential.

In the product management segment of our division we are also seeking:

## PRODUCT MANAGER - 16 BIT PRODUCTS

We seek an experienced 8-16 bit products manager. The successful candidate will have a proven record as a product manager in the office automation equipment arena. Initially required to launch and promote a new line of microprocessor-based office systems.

## MARKET ANALYSTS

Expected to perform in-depth European market and competitive analysis of all segments of the distributive data and office automation equipment market. Additional responsibilities will include consolidation of information for our various product marketing functions, publication of reports and participation in regular briefing sessions.

## VERTICAL MARKET APPLICATIONS

We seek a proven performer who has previous experience in the OEM/reseller market and the marketing of applications packages. The successful candidate will be responsible for the analysis of vertical and horizontal market opportunities. Additional responsibilities will include assisting with the reseller program and assisting product management functions.

The above posts carry attractive salaries plus free life assurance, private health cover, non-contributory pension scheme, 20 days' annual holiday.

Please forward your curriculum vitae without delay to: Miss S. J. Sewerin, Sec/PA to Managing Director, Codex (UK) Limited, Motorola Limited, Information Systems Group, 114/116 Thornton Road, Thornton Heath, Surrey CR4 6XB. Tel: 01-889 2101.

(283)



**MOTOROLA**  
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## CONTRACTORS

We have been retained by a leading specialist software house to supply a number of professional CONTRACT personnel for five- and eight-month contracts, starting in early September, working in both Essex and London with the following disciplines:

IBM COBOL ASSEMBLER (MVS and CICS desirable) Senior Analyst/Programmer  
IBM COBOL ASSEMBLER (MVS and CICS desirable) Programmer  
IBM COBOL (MVS desirable) Programmers

In addition the following contractors are required for IMMEDIATE starts:

ICL COBOL VMEB IDMS TPS 6 months+  
IBM PL/1 IMS JSP MVS 6 months+  
DEC PDP11/70 MUMPS 4 months  
CPM CICS COBOL 6 months  
IBM COBOL MVS TSO SPF 6 months

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Station House, Harrow Road  
Wembley Middlesex HA9 6DB

**SYSTEMS  
SUPPORT**  
SERVICES LTD

15701



## البنك العربي الوطني ARAB NATIONAL BANK

## DP opportunities in Saudi Arabia

Arab National Bank, one of the leading banks in Saudi Arabia, having in excess of 40 branches, is involved in a comprehensive computerization plan. Implementation of a computer network based on VAX 11-780 is underway. Following positions are open in the DP Directorate:

- ☐ Operations manager
- ☐ Systems programmers
- ☐ Systems analysts
- ☐ Programmers

Experience in VAX/VMS, RSX11/M, DECNET and TUTOR is necessary. Knowledge of Arabic is an advantage.

Arab National Bank, offers excellent salaries contingent upon experience (14 months salary per year) and attractive benefits program including: Furnished

accommodation for equivalent 4 month salary, Medical Care and ticket to the point of contract for applicant and his family.

Qualified applicants are urged to respond by sending resume and salary history (with copies of qualifications and experience history) in confidence to George Shaw.

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Dominic House, 171-177 London Road, Kingston-upon-Thames,  
Surrey KT2 6RA. Telephone 01-549 9236

**Sloangate**  
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# SIX OF THE BEST

## Project Manager

£16,000

You will have at least eight years' experience in DP and a proven track record in management and multiple project handling. In return you will be offered a demanding but rewarding position with an international company offering all the benefits of a major organisation including an excellent remuneration package and relocation assistance where necessary. Ref. B.B.1.

## Senior Systems Analyst

£10K

London NW

This is a genuine career opportunity within one of the country's best known retail organisations for an individual with three years' or more systems experience. Initially you will be responsible for a major systems upgrade, later moving onto important new projects developing sales and distribution systems. You should have seen at least one major project through to implementation, and should have a sound knowledge of dataflow, IBM environment. Ref. L.J.2

## Software Support

c.£11K

Southern England

Do you have at least five years' experience in real-time programming? With knowledge of X25 communications, 8085/8, UNIX, BCPL, or PL/M you could be working for one of the world's most successful companies at the sharp end of technology. The company is always prepared to offer commitment to its staff and this manifests itself in a highly organized career structure. Ref. W.C.3

## Analysts - move into project leading £10K-£12K

Surrey

We need a lead analyst with a minimum of five years' experience gained in an ICL 2900 environment to join a major insurance company. You will have responsibility for a small team of programmers and analysts working on the development of projects involving pensions, accounting, troubleshooting analysts and system enhancements. Insurance experience is desirable but not essential. This position offers variety and challenge coupled with the opportunity to develop a good career path in a stable well established organisation. Ref. W.C.4

## DEC/Programmers

to £11K

London

Would you like to work for the most successful consultancy in the world? Just two years' (three if 2 programming) experience on DEC 11/70/34 will interest this company. They need confident, capable people who are technically sound and want to develop their career rapidly. Activities in areas of client liaison and support are essential as you will be based on clients premises for the greater part of those major development projects. Ref. S.H.5

## Career minded Analyst/Programmers c.£10,500

Middlesex

If you are an enthusiastic programmer/analyst looking for a career path through analysis, design - into project management, this could be the opportunity you've been waiting for. A leading manufacturing company is seeking an individual to join a small project team involved in the analysis, design and development of major on-line and batch systems. Two years' IBM COBOL experience is essential, knowledge of database would be advantageous. Ref. L.J.6

For more details telephone 01-734 7394 or  
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01-734 7394



**Satellite Comms.**

**LONDON** £10,500-£13,000  
Our client is the world's leading organisation for supplying electronic information to the media and financial community. They have one of the largest private communications network in the world which is about to be replaced. At this exciting development phase candidates with a minimum of two years' experience of programming in high level Real Time languages such as PASCAL or PASCAL under the RMX/86 or VMS operating systems are required. GMF33/1

**Data Communications**

**LONDON** UP TO £16,000  
Our client is currently engaged in developing Software for the communications industry. They are seeking qualified Consultants with experience of communications standards and protocols, LANs and Office Automation. The company offers good salaries, good experience and an excellent career structure. DLM33/2

**Communications**

**BEDFORDSHIRE** £8,000-£10,500  
A systems engineer is required to work on the development of state-of-the-art communications systems products. This will include controller design, implementation, microcode, test software and systems software for high speed X25 and other network products. Applicants who hold a degree, with at least 2 years' experience of both hardware and software disciplines should apply. GMF33/3

**Local Area Network Designer**

**HERTS** £12,000-£16,000  
A leading manufacturer of terminals, modems and networks requires a Senior Engineer to join a small team defining a new generation of multiplexor products. The successful candidate will be responsible for the investigation, specification and design of local area network interfaces for new generation equipment. The position requires at least four years' design experience in a high technology environment. Applicants should have experience of at least two of the following: data communications, LANs, 16 bit microprocessor based design, Assembler for real time applications, multiprocessor systems design. GMF33/4

**DATAMATICS**  
RECRUITMENT SERVICES

01-399 9183

Datamatics, Freepost, Surbiton, Surrey KT6 5BR

**Image Processing**

**NORTH LONDON** £9,000-£10,000  
A highly respected manufacturer of image processing systems requires additional Software Engineers, to work on digital processing systems. You should have had at least one year postgraduate industrial experience and have programmed in Assembler during this period. Creative flair, committed interest and the willingness to succeed will result in extensive opportunities for career advancement. GMF33/5

**Process Control**

**LONDON** £11,000-£17,000  
The Industrial Group of a leading Software Company seek Consultants and Designers to develop process control software for the food, drink and drug industries. Candidates, dependent on level of experience will be offered a number of positions such as supervising projects, developing software on large projects, assisting sales teams in a technical support role and producing specifications. DLM33/6

**Modems Design**

**HERTS** £10,000-£15,000  
An engineer is required by a leading equipment manufacturer. Our client is ideally situated north of London, well served by rail and road. You will develop new microprocessor-based modems and local area network products and be expected to take a product from conception to production. A degree is highly desirable whilst at least two to three years' design experience with microprocessor-based logic systems is essential. GMF33/8

**Graphics/Cad**

**WEST COUNTRY** To £11,000  
A London-based Systems house is currently seeking scientific programmers to work on site in the West Country for a minimum of two years. Candidates should have experience of Fortran on VAX machines and an interest in graphics-type applications. In addition Programmers with Corel are required for engineering systems. DLM33/7

**DATAMATICS**  
RECRUITMENT SERVICES

01-399 9183

Datamatics, Freepost, Surbiton, Surrey KT6 5BR

**Network Support Assistant**

**CROYDON**  
up to £11,214 [under review] + car allowance  
Our rapidly expanding on-line Network, for present time one of the largest of its kind, needs an additional Telecommunications/Data specialist, to join our Network Control group, based at Croydon.

The Data Network consists of approximately 1400 terminals, attached to an IBM 3081 and an Amdahl 580/60. A further 40% growth is expected over the next few years including significant moves towards Distributed Processing.

Duties of this position will include:-  
□ Operational fault diagnosis and repair  
□ Installation and planning  
□ Interactive and distributed processing  
□ Equipment commissioning  
□ Maintenance data communications  
□ Assistance with new equipment evaluation/selection.

A considerable amount of travel throughout the South Eastern Region will be involved in this position, for which the appropriate allowance will be paid.

The person appointed should have at least five years experience in the above disciplines, and will preferably be educated to HNC or degree level.

Starting salary will be in the range £9834 - £11,214, currently under review with effect from 1st June 1983. Other benefits include relocation assistance where appropriate, excellent working conditions, generous holidays, sports and social facilities including squash and tennis.

Please write with full career details, quoting reference no. 07403 to:

Personnel Manager, South Eastern Gas, Segas House, Kothorne Street, Croydon CR9 1JU.

**SOUTH EASTERN GAS**

(5276)

**calma**  
USA

Calma is a leading supplier of complex computer graphics systems and a major operating company within the multi-billion dollar Ginn and Electric (USA) Group. Due to the continued expansion of the UK field service department, we have the following vacancy:

**UK FIELD SERVICE ENGINEER**

The successful candidate will be based from home and will be required to service systems mainly in Herts and the surrounding counties. He or she should have at least two years' field experience in mini computer systems and be able to diagnose faults to component level when required. Experience on CAD/CAM systems is desirable, although full training will be given at our Camberley headquarters. A highly competitive salary will be offered. Benefits include a company car, membership of a contributory pension scheme, BUPA and Life Assurance.

Applicants for this position, should in the first instance contact Mrs J. Brown on Camberley 882821 ext 264 and request an application form.

(5191)

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# Computer Weekly

Thursday, September 1, 1983

PT7 cuts costs

Computer Systems

## Scottish firm cracks communication poser

by Claire Gooding

A SMALL Scottish company claims to have cracked the problem of micro-mini-mainframe communication, which has been vexing the software majors.

Aberdeen-based MOM Systems has produced a cheap system which, it says, will do the things that MSA, Informatics, Cullinet, ADR, McCormack and Dodge, Cincom and others have been struggling with for months.

The firm will be marketing its solution, called ABE, for £295.

The package has been in use for over a year in 50 companies, including BP, Total and engineering firm Howard Doris. It has been used to link various machines including Univac, DEC Vax, IBM, Prime and Data General with Si-

rius, Comart and IBM micros. MOM is aiming the product at installations that have a hotchpotch of hardware unable to communicate except through specific applications.

ABE handles asynchronous communications, transferring complete files between, for example, an IBM micro and a Univac mainframe. At present the micro used to run ABE has to support the CPM operating system, although MOM is planning other implementations, such as MS-DOS.

"Most systems suppliers encourage users to buy a family of products, which are able to communicate only with one another," said MOM director Colin Balchin. "ABE breaks the mould of

providing a genus of products and makes it possible to have a patchwork quilt.

"Any micro user can have a 'window' on other machines - there are other communications programs, but none as generalised as this."

MOM has just clinched a deal with French oil firm Total for £600,000 worth of business based on ABE, to be used in the North Alwyn project. Various microsoftware packages, including the dBase II database, Wordstar word processing and SuperCalc spreadsheet, are linked through Comart micros to the ABE package, and from there to a Prime 2250 running the Vision project control software.

"When we'd cracked certain key

applications, we realised we'd made a breakthrough in technology," said Balchin.

The ABE software was written by Jim Duncan, of Granite Clips, a micro dealer which is now a subsidiary of the MOM group.

Although MOM has initially failed to interest IBM in its technology, it is planning to sell the ABE software to the US. Manufacturers including Comart and database supplier Condor are evaluating ABE with a view to incorporating it into their own products.

As well as selling ABE to be "bundled", MOM is planning to sell the software standalone through dealers and end user agents. First on the list are existing IBM, Sirius and Comart dealers.



Robots may become mechanical craftsmen.

## Robots poised to become craftsmen

by Rory Johnston

INDUSTRIAL robots could be turned into craftsmen as a result of research at a UK polytechnic.

Dr John Billingsley of Portsmouth Polytechnic last week told the annual meeting of the British Association for the Advancement of Science of his moves to develop robots that will go beyond simple assembly work to experiment at work, evaluating what they are producing.

Billingsley is working in co-operation with Tube Investments and aims to build what he calls the Craftman Robot, as opposed to the simple operative robots in use now.

His idea is that, instead of a robot being told "Carry out the

following motions on these pieces of materials", it could be told "Produce a component with the following specification". This would eliminate whole stages of the manufacturing process and lead to products of consistently higher quality.

He also proposed that simple vision systems, working, he said, "like a blind man's stick" could greatly extend the power of a robot to cope when things go wrong.

Billingsley's current work is producing heat regulator cookers. At the moment his robots are able to test the regulator heating them and then adjustments until they are according to specification.

## Lotus will sell MSA 1-2-3

by George Black

LOTUS Development of Massachusetts has reached an agreement with MSA to sell its best selling integrated micro spreadsheet 1-2-3 as part of its IBM mainframe-personal computer link.

The worldwide deal means software giant MSA will become a value-added reseller for the package of spreadsheet, graphics and database management system. But MSA will only be marketing the product to customers who also buy its mainframe software.

These will be able to get 1-2-3 for \$500 in MSA's Executive Pack - a system that will allow IBM-PC users to download data from the mainframe via the Fetchlink software jointly devised by MSA and its micro subsidiary Fetchware.

Lotus still has to consider how to sell 1-2-3 in this country as a standalone product and to this end is setting up a London office this week.

The 1-2-3 product was the brainchild of Visicorp's Mitchell Kapor, who set up Lotus in April 1982 backed by \$5 million. The system has sold 60,000 copies this year and is used by major US financial institutions such as Arthur Anderson and Merrill Lynch.

Until now, however, it has made little impact outside the US.

## Full order book fails to save Grundy business

by John Riley

GRUNDY Business Systems is going into liquidation, despite a full order book for its Newbrain portable microcomputer. Directors of the UK manufacturer last week called a creditors' meeting for September 8. Around 30 jobs will be lost.

Another UK portable computer manufacturer, Information and Technology Computer Services, is also on the point of liquidation. It leaves a string of creditors across the computer industry claiming they have been owed big sums for some months. The creditors are asking how the firm spent the £500,000 capital it claimed to have in March.

Grundy's troubles stem from an "over-optimistic view of the market", according to Tony Wheeler, financial director of sister company Grundy Electronics.

He said there was "insatiable demand" for the firm's products in the second half of 1982, so the company overstocked on components. But sales unexpectedly declined. At the same time there were delays with the introduction of enhancements.

Wheeler said the company was in the black as far as assets were concerned, but those assets could

not be turned into cash quickly enough. As a result the stock burden, mainly in the form of components, brought liquidity problems.

"The Grundy group has made cash injections to the tune of £500,000 since the problems arose," Wheeler said, "but they could not be turned back. We have reached the end of the road."

He added that Grundy was actively seeking someone to buy the business: the patent, trademarks and designs.

The Newbrain has been beset with problems since it was announced in 1980 by Newbury Laboratories. It was in line for use by the BBC in its microcomputer television series when Newbury sold the machine to Grundy. A six-month lull in development followed this change of ownership and the BBC contract went to Acorn.

Meanwhile creditors of Information and Technology Computer Services are determined to put the company into liquidation and "get someone to see if there are any assets to be recovered", according to David Simon, managing director of Rade Systems, which supplied the main boards for the company's Andromeda computer.

Simon said he was owed £25,000,

## Copyright dispute is settled

by Philip Hunter

A COPYRIGHT dispute between two Lancashire-based video games makers ended last week with the smaller company, Mr Micro, bowing to the superior financial muscle of Century Electronics.

Mr Micro swiftly agreed to withdraw its game, Hunchy, from the market and to destroy all copies and artwork. This was within one week of being accused of breach of copyright by Century Electronics, one of the Europe's largest makers of arcade games.

Mr Micro denied that the game was in breach of copyright. "It was based on the Hunchback of Notre Dame," said a spokeswoman for the company. "It was a business decision to withdraw the product. We'd rather devote our time to writing good software."

According to Mr Micro, the two companies had signed an agreement that made no specific reference to breach of copyright. But the company did admit to being aware of the existence of the Century game called Hunch Back while developing its own version.

However, Century's managing director, Dave Jones, described Mr Micro's claim that there was no breach of copyright as "absolute codswallop".

"We decided to nip it in the bud before they went into production."

## Apple hosts software development meeting

by George Black

APPLE is to host a software development conference in London next month for 200 delegates to unveil what it says is now dubbed the Macintosh range.

Steve Wozniak, who runs the Apple II software, will be assisted by Lisa designer Larry Tesler and marketing vice-president, Floyd Krumholz.

Apple has now consciously stopped talking about its Lisa machine and instead is referring instead to "a group of 32-bit products" based on Motorola's 68000

series of chips, which is expected to include the widely-labeled, lower-price Macintosh.

It is being stressed that the forthcoming conference will not feature the Macintosh launch, but is aimed purely at encouraging a broader understanding of market requirements among the professional software community.

The conference is also believed to be the first of a series of similar events in America and Europe for Lisa and Macintosh users.

ence follows up two similar presentations in Monterey earlier this year. It is scheduled for October 3 and 4 and will attract applications experts from Scandinavia, Italy, Ireland and Holland.

The controversial Lisa - debate centres on the price, as its design has been generally admired - has been in the spotlight since the launch of the computer. The controversy has been fuelled by reports that IBM's PC and DOS personal computers to sell in its new high-end market.



Wozniak at Apple conference.

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